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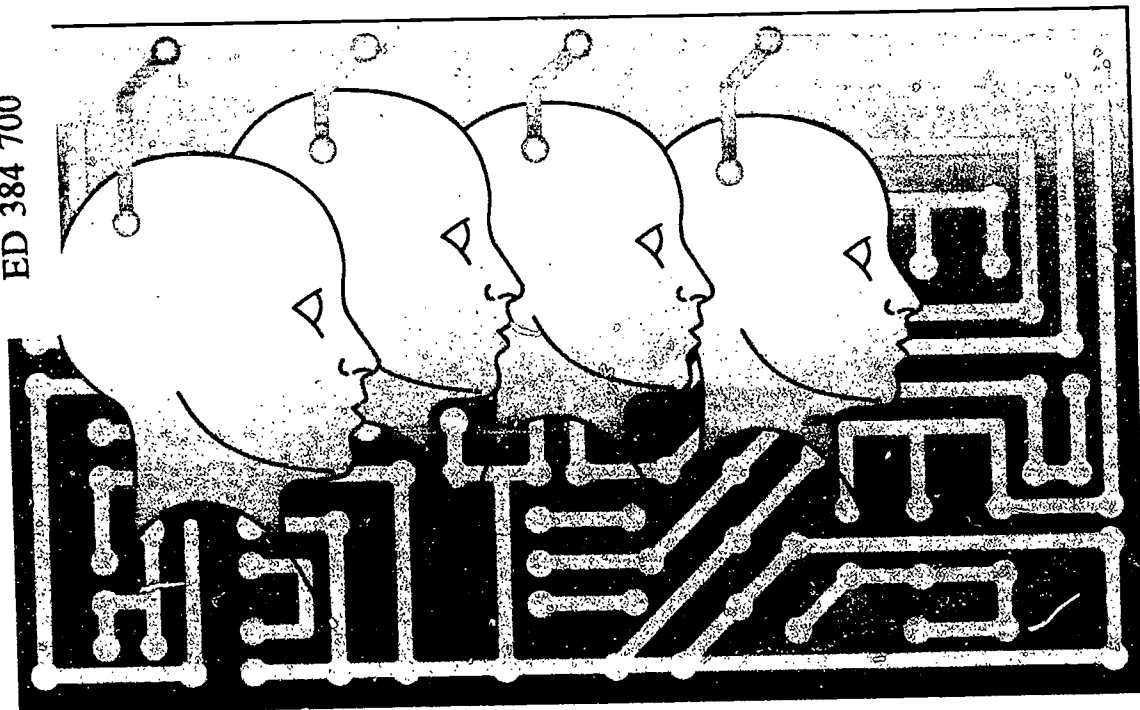
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ABSTRACT

This publication is part of the study materials for the distance education course, The Changing Workplace: Part B, in the Open Campus Program at Deakin University. The first part of the document examines current thinking regarding knowledge and control in workplaces emphasizing flexible production systems, flexible technology, and a flexible work force. The following topics are discussed: the rhetoric of public and private sector reports; mass production technologies and the rise of Fordism (alienation and the transformation of work); organization of work in Japan (dual labor markets, gender and the labor market, and just-in-time production systems); and educating flexible workers (education and training in the national interest and the resurgence of human capital theory, high technology and education, and skills in the workplace). The first part of the document contains 159 references. The following papers constitute approximately two-thirds of the document: "Flexible Production Systems and Regional Development" (A. J. Scott); "Fordism's Unknown Successor: A Comment on Scott's Theory of Flexible Accumulation and the Re-emergence of Regional Economies" (J. Lovering); "Towards Flexible Skill Formation and Technological Literacy: Challenges Facing the Education System" (J. Mathews, G. Hall, H. Smith); "The Australian Trade Union Movement and Post-Fordism" (I. Campbell); "Circuits of Capital and Industrial Restructuring: Adjustment in the Australian Clothing Industry" (J. A. Peck); and "The Limits to 'Japanisation': Just-in-Time, Labour Relations and the UK Automotive Industry" (P. Turnbull). Each paper contains references. The document also contains an eight-item annotated bibliography. (MN)



KNOWLEDGE AND CONTROL IN THE FLEXIBLE WORKPLACE

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PETER WATKINS

EAE610 THE CHANGING WORKPLACE: PART B

KNOWLEDGE AND CONTROL IN THE FLEXIBLE WORKPLACE

PETER WATKINS

Deakin University

This book has been produced as part of the study materials for EAE610 *The Changing Workplace: Part B*, which is one of the units offered by the Faculty of Education in Deakin University's Open Campus Program. It has been prepared for the unit team, whose members are:

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CONTENTS

SERIES INTRODUCTION	5}
KNOWLEDGE AND CONTROL IN THE FLEXIBLE WORKPLACE	7}
INTRODUCTION	9
THE RHETORIC OF PUBLIC AND PRIVATE SECTOR REPORTS	10
MASS PRODUCTION: TECHNOLOGIES AND THE RISE OF FORDISM	13
FORDISM	13
ALIENATION AND THE TRANSFORMATION OF WORK	15
THE RISE OF THE FLEXIBILITY DEBATE	19
THE ORGANISATION OF WORK IN JAPAN: THE FLEXIBLE FUTURE?	36
A DUAL LABOUR MARKET	37
GENDER AND THE LABOUR MARKET	38
JUST-IN-TIME	39
EDUCATING THE FLEXIBLE WORKER	40
EDUCATION AND TRAINING IN THE NATIONAL INTEREST: THE RESURGENCE OF HUMAN CAPITAL THEORY	42
HIGH TECHNOLOGY AND EDUCATION	46
SKILLS IN THE WORKPLACE	48
CONCLUSION	53
REFERENCES	55
READINGS	65}
1 FLEXIBLE PRODUCTION SYSTEMS AND REGIONAL DEVELOPMENT A.J. SCOTT	67
2 FORDISM'S UNKNOWN SUCCESSOR: A COMMENT ON SCOTT'S THEORY OF FLEXIBLE ACCUMULATION AND THE RE-EMERGENCE OF REGIONAL ECONOMIES J. LOVERING	83
3 TOWARDS FLEXIBLE SKILL FORMATION AND TECHNOLOGICAL LITERACY: CHALLENGES FACING THE EDUCATION SYSTEM J. MATHEWS, G. HALL & H. SMITH	99
4 THE AUSTRALIAN TRADE UNION MOVEMENT AND POST-FORDISM I. CAMPBELL	125
5 CIRCUITS OF CAPITAL AND INDUSTRIAL RESTRUCTURING: ADJUSTMENT IN THE AUSTRALIAN CLOTHING INDUSTRY J. A. PECK	151
6 THE LIMITS TO 'JAPANISATION': JUST-IN-TIME, LABOUR RELATIONS AND THE UK AUTOMOTIVE INDUSTRY P. TURNBULL	171
ANNOTATED BIBLIOGRAPHY	185}
ACKNOWLEDGMENTS	188}
ABOUT THE AUTHOR	189}

SERIES INTRODUCTION

The nature and purpose of education in the workplace has been the subject of much debate in Australia in recent years. While the vagaries of local and international competition have led many firms to reconsider the role of their workforce and the training requirements this entails, governments have been equally keen to adapt existing education systems to the perceived needs of industry. Leading union bodies have been distinguished in this debate by their pro-active role, outlining the path by which a reconstructed industrial climate can win the nation a new place in the world economy.

The series of monographs of which this volume is a part explores the approaches to learning currently modeled within industry. In the process the question inevitably arises as to whether existing orientations and practices are in the best interests of the various stakeholders in the workplace.

The arguments developed in these monographs address themselves to a range of contemporary issues in industrial education. To date, prevailing approaches have rested upon narrow, instrumentalist notions of learning; in their different ways, the writers have set out to challenge this orthodoxy. In doing so, they highlight the silences—on questions of gender, class or ethnicity—that underpin the behaviourist outlook still dominant in the world of training.

In preparing this series of monographs, the course team has sought to address issues that are of fundamental concern to those involved in the complex and demanding field of workplace learning. It is hoped that, in its own modest way, the pedagogy we have developed can serve to exemplify a different notion of what industrial education might become.

KNOWLEDGE AND CONTROL IN THE FLEXIBLE WORKPLACE

Introduction

The advent of a number of works (Piore & Sabel 1984; Lash & Urry 1987; Offe 1985) pointing to structural changes in Western economies has sparked off a lively debate on the extent, strength and implications of these changes (see Hyman & Streek 1988; Badham & Mathews 1989; Robins & Webster 1989; Wood 1982a; Knights & Willmott 1990). This debate has become so pervasive that the rhetoric of economic restructuring and flexibility dominates most of the public and private reports on the economy, education and training. Indeed, the term 'flexibility' has taken on the mantle of being very much the 'buzz' word of the late 1980s and early 1990s to describe changes in the mode of work. Moreover, it has also been touted as the panacea that will provide the solutions to Australia's, as well as other nations', current economic difficulties. In this context it is suggested that by being made more flexible, production systems will be able to cope more easily with the rapidly fluctuating demands of both domestic and vital export markets. Further, new, highly flexible electronic equipment and machinery can be speedily reprogrammed or readjusted to respond to the increasingly individualised fashion demands for both new goods and new processes. Last, an important aspect of flexibility is the need for workers who have been educated and trained to change quickly from one job to another whilst also contributing forms of knowledge on how productivity and/or profitability might be enhanced. But central to such a vision of a post-industrial Utopia is 'the relation between knowledge/information and the system of political and corporate power' (Webster & Robins 1989, p. 346).

This monograph examines the current pre-eminence of the notion of flexibility by, first, briefly examining the thrust of a number of recent public and private sector papers and reports dealing with technology, skills and education. Second, the monograph puts these documents in the theoretical and economic context of the argument which points to the decline of the Fordist, mass production solution to manufacturing, with its accompanying negative outcomes of declining productivity, increasing worker alienation and rising costs.

Third, the monograph critically looks at what is frequently called the post-Fordist solution with its emphasis on the development of flexible production systems, flexible technology and a flexible work force. Important in this scenario is the example of Japan which is frequently held up as *the* flexible model which other countries need to emulate (Pascal & Athos 1981; Ouchi 1981; Dore 1986, 1987; Vogel 1979, 1985). Last, using the work of such authors as Sweet in Australia and Levin and Rumberger in the USA, the implications for education and training which the future workplace

holds are discussed. These will be viewed in the context of considering what effect any changes toward greater flexibility will have in the key aspects of knowledge and control in the workplace.

The rhetoric of public and private sector reports

The Australian federal government in a number of papers (e.g. Dawkins 1988; Dawkins & Holding 1987; Department of Industrial Relations 1988) have discussed the part education and training should play in fostering a flexible ethos of work. Indeed, these papers argue that such flexibility in the workplace will help bring about various opportunities to develop more productive and efficient working arrangements to help make Australia's culture truly productive. In doing this Australians can greatly improve the quality of their working life by making workplaces fairer through the development of greater job satisfaction and improved career opportunities (see Department of Industrial Relations 1988).

This political position had been most clearly outlined in the earlier paper by Dawkins and Holding (1987) in their attempt to illustrate how 'our education and training systems should play an active role in responding to the major economic challenges now facing Australia' (1987, p. iii). Urgent action is required, they claimed, to restore Australia's world economic position particularly through an increased competitiveness which can deal with an ever-changing international economy. Crucial in meeting this problem is the availability of 'a highly trained and flexible labour force' (1987, pp. 3-4) which has the 'capacity to adapt to major changes in the economic environment' (1987, p. 4). Consequently, education and training programs are vital in the part they must play in 'directly conditioning the quality, depth and flexibility of our labour force skills' (1987, p. 4).

The graduates of educational institutions need to be flexible, Dawkins and Holding argue, because the traditional mass production systems with their:

standardised production will increasingly give way to flexible production systems especially in manufacturing. Such flexible systems place a high premium on broadly skilled staff at all levels of the design, production, management and marketing processes. (Dawkins & Holding 1987, pp. 4-5)

Current education and training practices, it is claimed, are too rigid, producing a range of skills which are too narrow to meet the needs of industry. As a result, 'flexibility is hampered by a range of outmoded legislative and arbitral constraints, which emphasise time-serving rather

than competence achieved' (Dawkins & Holding 1987, p. 10). As a solution the federal government is seen as 'taking action to achieve a more effective relationship between industry and the formal education sector' (Dawkins & Holding 1987, p. 14).

A similar approach to education has been presented in Dawkins' *Higher Education: A Policy Discussion Paper* (1987). In this paper he proposes a closer relationship between education, in this case tertiary institutions, and industry. In the instrumental 'human capital' rhetoric, which pervades this and most other contemporary documents, tertiary education is conceived in terms of an economic investment to rectify the worsening economic position in which Australia finds itself. A well-educated work force is seen to be the solution to the difficulties 'in a world in which the times have turned sharply against us' (Dawkins 1987, p. 2). Moreover 'our narrow export base and the volatility of world resource prices has meant that on a number of occasions the economy has had to shoulder a substantial adjustment burden' (Dawkins 1987, p. 8). To decrease our reliance on such a narrow export base it is considered imperative to expand the manufacturing and service sectors, which, it is suggested, will require, 'a more highly skilled and better educated workforce'. Consequently 'as the prime source of higher-level skills for the labour market, the higher education system has a critical role to play in restructuring the Australian economy' (Dawkins 1987, p. 8). Through such rhetoric, in both papers, Dawkins presents an instrumental and technical view of education in order to conjure up a vision of the means through which Australia's economic position might be improved and her rightful place in the world regained.

This instrumental view, in which education is a provider of human capital, has been echoed in a number of reports prepared for the federal government by the Australian Science and Technology Council (ASTEC). For instance, the report, *Education and National Needs* (ASTEC 1987a), stresses the instrumental nature of education in providing industry with human capital. From the start the report proclaims that 'the productivity of the workforce is dependent as much on its skills as it is on investment in physical capital' (ASTEC 1987a, p. 1). To successfully compete in export markets and reduce our trade deficit, Australia has to set about 'greatly improving the skills and flexibility of its workforce' (ASTEC 1987a, p. 5). Employees who are able to call on a variety of skills are being sought after in an increasingly wide spectrum of occupations. This is because, the report argues, 'the flexibility and adaptability of new technology require a similar flexibility and adaptability in those working with the technology' (ASTEC 1987a, p. 7). However, tertiary institutions have not responded in a suitable fashion to the needs of the business world. Indeed, it is suggested, 'Australia's higher education system should become more responsive to the need to develop competitiveness in our industry' (ASTEC 1987a, p. 28). The blame

for this apparent inflexibility within our higher education institutions lies with their management. Those in charge of running universities and other institutions have apparently neglected many of the ways which the report indicates would increase the technological orientation of higher education which ASTEC considers would 'assist industrial development and reflect student and employer needs' (ASTEC 1987a, p. 30).

ASTEC's *Wealth from Skills: Measures to Raise the Skills of the Workforce* (1987c) further endorses the arguments in the previous reports. The document examines a number of case studies dealing with the tendency toward flexible manufacturing techniques using flexible technology and concludes that 'the greater versatility of the newer equipment requires greater flexibility in the workforce which derives from each worker being more broadly skilled' (1987c, p. 5). However, flexibility in its more recent, wider context not only applies to the individual worker but also to the group in which the worker participates. Thus there is a need to educate workers 'who have a broad understanding of many skills and are able to perform all of the tasks usually performed by the team' (ASTEC 1987c, p. 5). Moreover, this emphasis on the interdependence of workers and on role sharing has increasingly been given prominence through the use of quality circles and just-in-time management systems. Thus, ASTEC takes a broad view of skill formation which encompasses not only specific skills but also those of working within and through a work group.

But the federal government and its agencies have not been alone in advocating an upgrading and the multiskilling of the work force to cope with the new forms and configurations of flexible production and technology. Such diverse groups as the Australian Manufacturing Council with its *Skills in Australian Manufacturing* (1988) and *The Global Challenge* (1990), the Australian Council of Trade Unions (ACTU) *Australia Reconstructed* (1987), and the Business Council of Australia (BCA) *Policies for Skill Formation* (1988), have set about proposing similar solutions to the economic difficulties confronting Australia. For instance, *Skills in Australian Manufacturing* emphasises that:

market requirements demand the continuous utilisation of new technology, new and flexible levels of skill, new work organisation and improved industrial relations. They require a new level of workforce commitment, in which education plays a crucial role. (Australian Manufacturing Council 1988, p. 1)

In a similar vein the ACTU document suggests that if Australian industry is going to compete successfully overseas then a greater investment in raising the levels of skill and technology education is required (see 1987, p. 123). This position has also been endorsed by the BCA which asserts that the changes which are occurring in technology are:

putting higher premiums on new flexible work design, organisation and practice. All of these, in turn, put a premium on greater employee involvement and skill formation. (BCA 1988, p. 4)

In summary, the papers and reports quite openly present a human capital position where education is seen as overtly instrumental in restoring Australia to a pre-eminent position within the world economy. The key argument in achieving such a position appears to be in the education and training of a flexible work force to cope with the new flexible production systems and flexible technologies that are being set in operation. But here also, the charge could be made that the technology itself is being viewed in a deterministic fashion in that it must inevitably eventuate in a particular form. As such, this is a conception of a technology which is devoid of human involvement and to whose trajectory workers must react. In order to avoid such an ahistorical, deterministic position it is necessary to put the alleged demise of the Fordist, mass production system and the rise of flexible manufacturing into its historical context.

Mass production technologies and the rise of Fordism

The new flexible manifestations of work are seen as being a replacement for the mass production techniques developed by Henry Ford at the beginning of the century. It is therefore necessary to examine the historical origins of the mass production system and the characteristics which many writers such as Piore and Sabel (1984) claim have been discarded for more flexible practices.

Fordism

Central to Fordism is the standardisation and fragmentation of production which asserts the basic principles of scientific management advocated by Frederick Winslow Taylor. Ford adopted these principles in the production of his cars. They embodied the systematic deskilling of labour through the separation of conception from execution, time and motion studies and the fragmentation of tasks. Further, Ford perceived the advantages that would come to car production through the application of the conveyor, assembly line techniques which were employed in the Midwestern meat processing plants. Thus, Ford's major contribution to the scientific management of production was that:

not only did Ford appropriate information/knowledge within the production process, but he also incorporated it into the technology of

his production lines to achieve technical control over the labor process.
(Webster & Robins 1989, p. 330)

The assembly line enhanced mass production through the continuous flow of work to employees who were required to perform repetitive minute tasks. Moreover, control over the time and motion of work was embedded within the line. The conveyor belt or tracks not only got the work off the floor but also, through mechanical means, set the timing of the work which the employees had to do. Importantly, the introduction of continuous standardised work could also lead to a reduction of unit costs through lower labour and material costs. In particular, labour costs were reduced in two important ways. First, skilled craftspeople were replaced with unskilled workers. The introduction of highly specialised machinery, which had the skills of the craftspeople built into it, meant that skilled work could now be performed by people with little training or experience. Second, the continuous work-flow process allowed work to be gradually intensified, leading also to a reduction in labour costs. Standardised production also meant, however, that any initiative or individual variation which a worker may have instigated was eradicated. Workers became an appendage to the machines they tended for:

The theory of establishing a single speed and single feed was to *eliminate the judgement of the operator and to predetermine the day's output*. If this was not obtained, the cause was readily detected and almost as readily remedied. (Gartman 1982, pp. 43-4)

Such work conditions had disastrous consequences on the assembly lines which produced Ford's Model T cars. As Sward remarks:

Ford's men had begun to desert him in large numbers as early as 1910. With the coming of the assembly line, their ranks almost literally fell apart; the company soon found it next to impossible to keep its working force intact, let alone expand it. (Sward 1968, pp. 48-9)

Ford's solution to this worker reaction was to introduce the Five Dollar Day at a time when the daily wage on the assembly line was \$2.34 (Maltese 1975). As there was an economic depression with many out of work Ford's timing was excellent. The result was that ten thousand people flocked to the Ford factory and into Detroit generally. This mass movement of people generated a large surplus of workers who were willing to replace anyone who complained or objected to the innovations in the work process, particularly those which already accelerated the pace of work on the line.

The higher wages also had wider ramifications than in the actual factory. They meant that the workers could now become consumers and

buy the goods they were producing. Thus Fordism implied a complementary development of production and consumption. Commentators such as Blackburn et al. (1982) argue that Fordism implied uniform modes of consumption satisfied through mass produced commodities and financed through a social wage, supplemented by extensive credit facilities.

Until the mid-1970s Fordist assumptions dominated work practices in most industrialised countries. However, since the mid-1970s, an increasing rift has been perceived between the Fordist approach and the ability of capitalism to satisfactorily generate itself. Davis argues that the maturation of Fordism:

has produced a constellation of crisis that interlaces contradictions at the levels of the composition of capital, the composition of labour, the relation of class forces, the international division of labour, and the relative autonomy of the world financial system. (Davis 1984, p. 16)

In particular, the crisis has fostered the need to generate greater productivity from labour through a search for new labour-management techniques which incorporate worker flexibility through autonomous work groups, quality circles and work islands in order to negate the alienation inherent in the Fordist and Taylor management approaches. But on the other hand, as Walker illustrates:

production 'flexibility' ... may depend less on new machinery and upgraded skills than on flexible methods of exploiting labour such as the use of temporaries, external subcontracting, and the abuse of illegal immigrants. (Walker 1989, p. 84)

Alienation and the transformation of work

A central theme which characterises the implementation of Taylor's and Ford's approaches to the organisation of work has been the struggle to reduce the control which people in the workplace have in carrying out their work. In contrast, the proponents of flexible specialisation claim that their way of organising work allows greater worker autonomy and creativity. These claims will be examined later in this monograph, however, as the quote from Walker indicates, there are some who question such a position, nevertheless, the advocates of flexible specialisation point out that the struggle by management for more and more control during the Fordist period frequently resulted in work which was fragmented, routine, repetitive and boring and which led eventually to its own downfall.

In Fordist work situations the workers are separated from the knowledge and thought which goes into the creation of the product and from the

finished product itself. Such industrial practices destroy initiative and creative involvement, causing people to do merely what they have been ordered to do. The ability to work is, as a result, a commodity which is bought and sold. People work for money and not for the joy of creating a particular production good. Thompson (1985) has vividly depicted the alienation that comes about through the lack of involvement which workers may often have toward their work when the control of the work practices is separated from them. At Chrysler:

On the Door-Hanging section last year, the Superintendent instructed the men to work to their man assignments (i.e. job specifications). Their written instructions were that they were to do 14 two-door cars, 14 Estates, and 21 four-door saloon cars. The men accepted—but management couldn't get the cars into correct rotation. The result was chaos, as the workers did just what they had been told to do. Two-door cars were coming down the line with doors for four-door cars—7 inches too short ... Estate car doors were being smashed into position on whatever car turned up next! The Superintendent begged the men to return to their own patterns of working. But the men insisted on working strictly to their instructions for the rest of the shift. The result of this was that management allowed us to work to our own work patterns. They left it to us. The situation is the same today. (cited in Thompson 1985, p. 137)

In such a work situation 'alienation, then, is disconnection, separation—the process by which human beings are cut adrift from their natural moorings in the world as the result of unnatural, alien work arrangements' (Erikson 1986, p. 2).

Anthony (1982) points out that alienation has a number of senses which reflect the condition in which the alienated person can find him or herself. These relate to four dimensions of alienated work: alienation from labour, alienation from the product, alienation from self and alienation from others. First, there is the sense of externalisation. In this perspective workers are always alienated, for it is their work which goes into and forms part of the finished product. The very act of production is an act of externalisation. A part of the workers' skill, knowledge, time and effort is incorporated through their labour into the finished product. A second and perhaps more significant sense of alienation results from the fact that the objects produced by the workers are not owned by them but are owned by other people. This has important implications for the control of the production process. Because the products are the possessions of the entrepreneur, there is a continuous drive to lift labour productivity while minimising labour costs. This is the basis of the struggle between capital and labour. Third, there is the sense that through technology the actual work process

becomes alienating. Work in this context implies a condition where the work practices are outside the comprehension and the experiences of the worker. The self of the person is alienated. Last, there is the sense of being alienated from other people. From this perspective alienation exists when a person's worth is measured and legitimated by goods and the possession of commodities, not by the community of which the person is part.

One of the most influential writers on alienation, Seeman, has identified a number of components which he sees as part of the condition of alienation. These components are powerlessness, meaninglessness, social isolation and self-estrangement (Seeman 1959, 1983).

Powerlessness gives rise to a condition where people feel that they have little control over events which affect them. This concept is closely linked to reification where objects are given a life and direction of their own, while people are merely pawns at the mercy of, for instance, 'technology'. *Meaninglessness* refers to the individual's 'sense of the incomprehensibility of social affairs, whose dynamics one does not understand and whose future course one cannot predict' (Seeman 1983, p. 177). Such a condition is likely to eventuate where work is divided into highly specialised segments. The origin, form and destination of the finished product is unknown and means little to the worker on the production line. *Social isolation* eventuates when there is a loss of community and social cohesion. Through the need to sell their labour power as a commodity, people come into competition with each other in the quest for work. In this way people may be alienated from one another. Last, Seeman suggests the component of *self-estrangement*. In this condition people lose touch with their feelings. They become detached from the work they do. The worker unthinkingly goes through the required motions while thinking of other matters. This form of alienation has been recently described by a former printer in the *Victorian Teacher*:

In this 'automatic reflex' state, operators like me tend to daydream about holidays, winning Tattsлото, jumping into the cot with Miss Helena from 'Romper Room'—all the usual psychic trivia which gets us through the day. (Phillips 1986, p. 8)

Seeman's dimensions of alienation were further developed by Blauner (1964). Blauner compared attitudinal measures of work dissatisfaction in the printing, textile, automotive and chemical industries. He found that workers in the high technology chemical industry were less dissatisfied and, so he claimed, less alienated than those in the other industries. Blauner concluded that increased technological automation:

increases the worker's control over his work process and checks the further division of labour growth of large factories. The result is meaningful work in a more cohesive, integrated industrial climate. (Blauner 1964, p. 182)

Salaman (1981) has pointed out a number of major problems associated with the claims of Blauner. First, his use of the concept alienation, essentially in terms of 'subjective feeling states', neglects the form and social relations of the workplace. Indeed, by focusing on adjusting the individual, his research assumes a pro management stance while ignoring the conditions under which the person works. This emphasis on a subjective approach runs the risk of 'doing sociology without society' (Israel 1971, p. 206). Second, Salaman claims that Blauner's analysis of automated technology is empirically suspect. Salaman shows that technicians work in varied situations which in some instances may make them privileged but in others leave them completely powerless. Further, Nichols and Beynon (1977) in their research present a very different picture from the management-centred view of Blauner. They found at the chemical plant they studied that the majority of employees were still employed in unskilled, dirty and arduous work. In this highly sophisticated plant workers still filled, tied and loaded bags of chemicals: 'very much the same sort of work to be found on traditional assembly lines in technically less "progressive" sectors' (Nichols & Beynon 1977, p. 68).

Third, Salaman (1981) illustrates that Blauner's research is ahistorical and atheoretical. There is no attempt by Blauner to place his research on alienation and technology within an historical and social context. The consequence of this for Blauner is that he 'pays scant attention to the forces lying behind the choice of technology' (Salaman 1981, p. 93). The result is a view of the technological factor of work as a determinant of alienation and which, moreover, is independent and autonomous, separate from general social forces and considerations (see Watkins 1986a). Blauner's and Seeman's approaches which centre on the individual in the workplace have prompted general criticism. The focus of attention is the psychological condition of the individual person which Salaman (1981) and others claim is an example of management-biased research. The concentration on the subjective aspect of alienation in the workplace has led to a neglect of alienation's objective features (Thompson 1985).

A number of scholars (e.g. Marcuse 1964; Schaff 1981) have stressed that alienation is both a subjective state of individual consciousness and an objective social condition. In the latter instance, alienation in the workplace is an objective condition which comes about through the structures of unequal power and domination embedded in the social relations of work.

This objective theme is taken up by Marcuse (1964) who argues that society is becoming increasingly one-dimensional through the pervasive influence of the commodification of culture. Because of the dominance of consumer items in their life, people identify with the goods they buy. This 'reality constitutes a more progressive stage of alienation. The latter has become entirely objective; the subject which is alienated is swallowed up by

its alienated existence' (Marcuse 1964, p. 11).

Emphasis on the subjective aspect of alienation can frequently give an erroneous perception which implies that an alienated person is not normal and that efforts must be made to return the individual to a normal condition. As a result, the structure of power and rewards in the workplace tends to be obscured and neglected. Consequently, an uncritical approach can be adopted which centres on the individual's subjective condition but which excludes the social relations and material conditions which give rise to that individual's condition. These aspects should also be kept in mind when looking at examples of flexible workplaces.

Concern for worker dissatisfaction has led to a new body of literature on job redesign, autonomous work groups, workplace democracy and self-directed work (see Seeman 1983, p. 80; Carnoy & Levin 1985). The contradictory effects of Fordist mass production, which in introducing technology designed to increase managerial control actually produces alienated, discontented workers, are at the basis of the attempts to employ the concept of team culture and flexible working teams in the workplace. Companies are now seeking to foster a corporate culture with an emphasis on workers' flexibility in an effort to extract greater commitment and productivity from their employees (Watkins 1991). However, it should be stressed that the main thrust comes from industrial psychologists, representing management interests, who seek to change the subjective state of the individual worker. Mandel and Novak (1970) argue that the basis of this exercise is not the doing-away-with of the objective reality through which work is alienated; instead, the eradication of the worker's awareness of this alienated reality is the focus of the attention of these human relations and motivation experts (see Watkins 1986b). Thus, while capital accumulation through profit maximisation is still the major economic imperative, there appears to be a belief that this can be best achieved through flexible manufacturing approaches employing flexible technology and flexible workers.

The rise of the flexibility debate

A number of authors have argued that the recent tendency toward lower production and declining capital accumulation generated by factors such as the alienation bought on by Fordism signals the decline of that system of production (Aglietta 1976; Piore & Sabel 1984; Scott & Storper 1987). These writers suggest that a number of discernible epoches of capitalist growth have been linked with a particular ensemble of production forms that have eventually become dominant. Scott and Storper point out that:

The epoch of growth associated with each of these ensembles is typified by a regime of accumulation, and each regime of accumulation

is in turn sustained by a set of macrosocial and political arrangements that can be called a *mode of social regulation*. (Scott & Storper 1987, p. 216)

These arrangements involve numerous social, political and economic relationships including education, social services, consumer needs and so on. They facilitate and enhance the accumulation process by providing a means of adjustment to both the internal and external crises which beset the capitalist economy from time to time. However, the dominant Fordist method of accumulation which progressively deskills and alienates its work force is seen to be breaking down.

In their influential book *The Second Industrial Divide* (1984), Piore and Sabel put the case that the present deterioration in economic performance, which the capitalist world is experiencing, results from the fact that the model of industrial development, which is based on mass production with its use of special purpose machines and semiskilled workers to produce standardised products, has reached its limits. They point to the nineteenth century as the period of the first industrial divide. At that time, they argue, the emergence of the techniques and organisations giving rise to the mass production of goods, especially in Great Britain and also the USA, overwhelmed and supplanted the less rigid, craft-based ways of production that had previously existed. This paradigm reached its zenith in the mass production techniques perfected by Ford. It was essentially characterised by three fundamental principles:

- 1 the standardisation of the product;
- 2 the use of special purpose equipment; and
- 3 the elimination of skilled labour in the production process.

At the same time the tedious, alienating work was contrived to be offset by relatively high wages which also resulted in commodities like the car becoming a mass consumer item.

However Piore and Sabel suggest that mass production and deskilling can only go so far before it starts to become counter-productive, leading to declining productivity and profitability. As a consequence, they claim that:

we are living through a second industrial divide ... (when) the spread of flexible specialization suggests that the way out of the crisis requires a shift of technological paradigm and a new system of regulation. (Piore & Sabel 1984, p. 252)

To support their case for a second industrial divide they present two arguments (Piore & Sabel 1984, p. 258). The first is based on the belief that there is an immanent logic within technological development. Through the application of this logic, it is apparent that the use of computers in manufacturing and other spheres of work fosters the development of flexible

systems. The second argument, drawing on evidence from technologies other than the computer, supports the claim that under appropriate conditions of business competition, flexible production systems can generate increased efficiency. As a consequence of these arguments, they claim that we are seeing the rise of networks of technologically sophisticated, highly flexible manufacturing firms and a possible return to the craft heritage of pre-Fordist days (Piore & Sabel 1984, p. 7).

Roobeck (1987) essentially agrees with Piore and Sabel. While also warning against any hint of determinism, which might pervade the works of such writers, Roobeck lists a number of factors contributing to the demise of Fordism and the rise of flexibility. For instance, as work became more deskilled and education levels rose, the problems of alienation increased: this led to a related problem which was that the quality of work declined as discontent increased in the work force. Also important was the rising cost of resources, especially oil, which when associated with deteriorating production levels indicated that the Fordist methods of production had reached their limits. The problems have been exacerbated by the difficulties of expanding markets into the developing countries. Any expansion is limited because of the increasing debt burden of these countries. These factors, linked to the problems of overcapacity resulting in large numbers of unsold products (which have to be stored), have given rise to a demand for greater diversification of goods and increased flexibility in the production process. The solution, Roobeck suggests, lies in the fact that:

It is characteristic of the new technologies that they all contribute to energy-, material- and employment-saving innovations as a result of the *miniaturization* and '*dematerialization*' tendency. The latter term is used to describe the tendency to produce more of higher quality with less physical and material input in shorter production chains. At the same time the higher degree of technological and managerial control makes possible products of a higher quality which can be produced in a more compact (smaller plants, fewer supplies) and flexible (in time and in place) way. (Roobeck 1987, p. 142)

Lash and Urry (1987) in their interpretation of capitalist history as a sequence of liberal capitalism, organised capitalism and disorganised capitalism, have suggested a number of significant features that they claim are indicative of an end of organised capitalism. The effect of deindustrialisation, with extensive plant closure and labour lay-offs, has meant that the corporatist coalition which existed at the state level has waned in many countries. Further, the growth of nationally based corporations into transnationals has meant that the national accumulation of capital has been put at risk. A result of these two factors has been a steady decline in the number of blue-collar workers while the service industry has

expanded. This decline has also affected the formerly powerful trade union movement with a countervailing rise in the power of capital. The expansion of management's power has been reflected in the increasing prevalence of individualised wage contracts and wage bargaining at the plant level, excluding any centralised trade union involvement.

Such changes have come about in the present circumstances through a number of economic crises. These crises can be generalised as crises in productivity, competition and profitability. Roobeck (1987) argues that the decline in productivity can be explained by realising that items such as durable consumer goods and most process technologies had entered a phase of maturity with consequent lower sales. Moreover, other factors such as the saturation of mass markets, the increasing costs of safety and environmental measures, and the sharp rises in fuel costs in the 1970s have all contributed to a sharp decline in productivity.

Competition is stressed by Schoenberger (1987, 1988) as a major factor in the current economic crises in organised capitalism. She argues that the exacerbation of competition in the international arena has come about through the export of the Fordist, mass production mode of manufacturing into Europe but perhaps more crucially into newly industrialised countries. As Schoenberger explains:

To a considerable extent, the newly industrializing countries and even Japan (although less so now than in previous decades) have developed a highly *externalized* Fordist system in the sense that Fordist production techniques have been adopted while the expansion of domestic mass consumption has lagged far behind. This has allowed these countries to keep wage costs extremely low while relying on foreign markets to absorb a large share of their output. (Schoenberger 1988, pp. 249-50)

Through this process, the stability and principles of competition inherent within the Fordist system have been consistently undermined. Thus Schoenberger concludes that 'the forms of competition that were both structured by and contributed to the maintenance of this system were also deeply implicated in the growing tendency to crisis' (1988, p. 252).

Roobeck (1987) and Cooke (1987, 1988) point to the problem of declining profitability within the Fordist system of organised capitalism. Roobeck (1987) argues that the trend toward the regulation of wages and the maintenance of minimum wage levels meant that 'under Fordism *wages rose, eventually without a further parallel rise in productivity*' (1987, p. 138). Cooke (1988) complements this argument, pointing to the decrease in productivity that, coupled with fiercer competition, was also an important factor leading to low levels of profitability. Thus, in the current crises 'low productivity and heightened international competition inevitably act as a pincer to produce a profit squeeze in weaker economies' (1988, p. 283). These factors

were further complicated by increasing alienation at the shop floor level, which expressed itself in demands for more money wages and manifestations of active discontent. The profit squeeze of lower productivity, higher wages and expanding overseas competition added pressures on the state which 'found that Keynesianism did not in fact allow it to overcome these contradictions and plan the economy' (Panitch 1987, p. 134).

While there seems to be general agreement on the reasons for the economic crises of the 1970s and 1980s, the end of the organised capitalism thesis, especially as presented by Lash and Urry (1987) and more incidentally in the work of Piore and Sabel (1984), has come under criticism. Williams et al. (1987), after a review of the literature, concluded that the thesis that mass production is in a state of crises can be rejected for two reasons. First, such a proposition is founded on an incorrect view of the extent and range of mass production and certainly glosses over the differences that exist. Second, Williams et al. claim that the thesis is not supported by current workplace trends and by the way new technology is implemented (1987, p. 434). Similarly, Hyman and Streek (1988) suggest that the concept of organised capitalism as exemplified by the Fordist system of mass production, has been stereotyped, presenting a misleading picture of how production was organised. In particular, too heavy a stress has been placed on the automobile industry which might not be typical of the general economy. Finally, Cooke (1987) mounts two criticisms of the end of organised capitalism perspective. First, he argues that the concept of 'organised', in the sense of concentrated, centralised locales of mass production, has been overstated. During the so-called period of organised capitalism there have been crucial variations occurring in the organisation of capital, in the relationship between finance and industrial capital, capital and the state, capital and labour and the stress between national and international development. Further, Cooke points out that:

although mass-production became the dominant ideological tendency, or *technological paradigm*, it was far from the only, or necessarily major form of production, either of goods or services. (Cooke 1987, p. 310)

Second, Cooke attacks the notion that currently capitalism is not organised. Indeed, he suggests that capitalism is becoming more ordered, albeit in differing ways, as companies adjust to the effects of economic recession. He claims that the largest are:

adjusting their strategies, absorbing important lessons in product-quality, work organization and, not least, relationships with the galaxies of small-to-medium sized sub-contractors on which they depend, in order to re-assert their competitive position in the world and domestic market place. (Cooke 1987, p. 311)

Last, the thesis can be criticised on the notable absence of Japan and the newly industrialised countries of East Asia. This is most puzzling 'especially as it is the massively *organized* capital of Japan that western industry most fears' (Sayer 1988, p. 273).

While a wide spectrum of groups—academics, employers, unions and politicians—have advocated the path toward flexibility, they do in fact seem to hold differing visions of the actual practice. These differences will be explored briefly later. On the one hand, employees see flexibility as restoring craft skills, autonomy and wider career opportunity, on the other hand employers see flexibility as breaking down traditional work practices, rigid wage rates, the power of unions and restoring managerial control. In emphasising the latter view, Tolliday and Zeitlin (1986) stress that, with the introduction of flexible production systems (as exemplified by job rotation including transfers between posts without wage renegotiation), management has re-established its pre-eminence in the way work practices are deployed. Indeed they assure the reader that:

management has been most concerned with the reassertion of its authority on the shop floor against the unions and the improvement of productivity through tighter discipline and more intensive working ... management has made increased flexibility of labour deployment a central priority. (Tolliday & Zeitlin 1986, pp. 18–19)

At this point it is important to distinguish the forms of flexibility that are discussed in the literature. Flexibility can refer to, first, the way the production process is structured. Second, the way technology is constructed and utilised may facilitate and enhance the flexible production of goods. Last, flexibility can be viewed as a characteristic of labour not only in coping with the first two views of flexibility but also as a desirable quality which workers can utilise to cope with a multitude of products produced in a variety of circumstances. In other words, there are a number of ways in which the term flexibility can be interpreted and it is to these interpretations that the monograph now turns.

Flexible production

The dominant regime of Fordist accumulation was marked by large-scale enterprises based on the assumption that economies of scale were of paramount importance in the production process that needed to be vertically integrated. Thus, at Ford's car plant at River Rouge in Detroit the coal and iron ore went in at one end of the plant while the finished car came out at the other end. However, with the recent economic problems manifest in the Fordist model, vertical disintegration is occurring. Vertical disintegration generates increased profits through the external economies of reducing production costs by the increased specialisation of loosely connected firms.

At present there are a number of production areas which are characterised by disintegration with an extended division of labour. These areas would seem to include, first, intensive industries designing specialist products which are not usually intended for final consumption but rather go on to another stage of production. Second, the wide range of various high technology industries would also appear to have the characteristics of disintegration. Third, those industries which provide various service functions would also be included in this category. Scott and Storper (1986, p. 303) argue that firms will vertically disintegrate where:

- 1 production methods physically resist capital deepening and resynthesis;
- 2 output markets are unstable and unpredictable, with the consequence that producers will disintegrate in order to avoid the backward transmission of uncertainty through the vertical structure of the firm; and
- 3 the labour force is segmentable so that work can be readily subcontracted out to low-wage plants in secondary labour markets (see also Lovering 1990).

Advocates of a disintegrated or a flexibly specialised production process frequently cite the example of northern Italy and particularly the Benetton Company as a model which the industrial world, including Australia, should emulate (e.g. Piore & Sabel 1984; Burke 1990). Burke, for instance, after examining the organisation of work in northern Italy claims that in Australia:

The new manufacturing culture calls for better technology and dramatic changes in the relationships between management, supervisory staff and employees. This change can be described as building a more flexible, participative and cooperative relations within the firm. ... firms may need also to consider their external relations particularly with other firms and sources of information, in a new, more flexible and, cooperative manner. (Burke 1990, p. 38)

In light of such calls to follow the Italian example it would be wise to examine the strategies of the Italian fashion house Benetton in more detail, particularly the manner in which knowledge-information have been interwoven into the control of the flexible production process.

At the end of the 1970s Benetton was a small Italian family business with no exports and a moderate turnover. However, by the mid-1980s Benetton was selling in two thousand five hundred shops throughout the world and turnover had increased by over seven hundred per cent. The subsequent 'Benettonisation' of the globe has included all the major cities of West Germany, the USA and even Japan (Mitter 1986, p. 47). The

expansion of the company has involved the meticulous collation of knowledge concerning world fashion trends, which has led in turn to tight control over marketing and retailing. The speedy collection of information is then linked to a flexible production system so that there can be a swift response to market trends. To facilitate this process a complex information network has been installed in the company headquarters, Villa Orba. This computerised network links up with the computerised cash registers in Benetton shops throughout the world. Each outlet is then able to relay highly detailed information daily to Italy on sales and what is popular and what is not. If green is 'in' then the garments, which are usually held in a bleached condition, can be quickly dyed and shipped to the appropriate market.

Through this marketing process, fashion, as Luciano Benetton claims, has been raised from 'the artisanal to the industrial level' (Mitter 1986, p. 48). The fashion goods are standardised, in a bleached form, with shops from Asia to South America virtually selling identical products. Thus, Wood points out that Benetton's:

opening of production facilities outside Italy has been very much along the world car model with the various locations specializing in the production of one or more types of product. (Wood 1989a, p. 25)

Flexibility for Benetton is provided by the core and peripheral nature of the labour markets supplying the garments. In particular, the flexibility is enhanced by the networking relationships between the two parts. During the 1980s Benetton employed less than one thousand five hundred people in its factories, but through its subcontracting network it gave work to over ten thousand more people employed in two hundred small firms (Phillimore 1989, p. 84). The highly skilled work of designing, dyeing, cutting and final ironing is done by the core labour force directly employed by Benetton. The less skilled work of weaving and making up is done by the peripheral, allegedly artisanal, subcontractors. The work force in these small firms is mainly made up of women who, it is assumed, can be employed or dismissed as the market dictates. In this way access to jobs in core-peripheral labour markets in northern Italy is regulated directly by gender, age and family connections (Gough 1986, p. 68). For, as Mitter explains:

these small artisanal firms in Italy, in turn (like ethnic sweatshops in Britain), rely on a familial network for recruitment of female machinists, who work either on the factory floor or from home. (Mitter 1986, p. 48)

It is through these processes that employers such as Benetton can utilise flexible production processes to reduce overheads, keep wage costs low, facilitate work force flexibility, reduce the demands of a large work force while utilising the highest state of the art computer and information

technologies to speedily respond to any sudden changes in the fashion market (see also Taplin 1989).

It should be seen from the previous example that disintegration of the production process combined with centralisation of knowledge gives management greater flexibility and control in the way in which both capital and labour can be deployed. The closer control which flexibility offers permits entrepreneurs to combine and recombine diverse production units together into loose, rapidly moving coalitions. Such arrangements also affect the labour market by accentuating the differences between the primary and secondary markets. Managers usually maintain a core of highly skilled high-wage workers. The demand for low-skilled work, which can be quite sizeable even in high technology industries, is more often than not farmed out to subcontractors (Watkins 1986a). Sayer has highlighted the importance of this subcontracting in the flexibility of Japanese industry. Here:

major companies usually draw upon several 'layers' of subcontractors, which act as shock absorbers for demand fluctuations ... Lifetime employment is absent in the subcontract sector and the lower the 'layer' of subcontract work, the greater the proportion of female workers and the lower the pay. (Sayer 1986, pp. 55-6)

Moreover, in the disintegrated production structure the labour market is highly fluid with high rates of labour turnover and extensive part-time and temporary work. Such work usually utilises a high proportion of workers such as women, adolescents and recent immigrants who tend to exert little political influence.

To exercise the maximum degree of flexibility, entrepreneurs have tended to abandon the old industrial sites for green-field locations (Scott 1988). Here they can avoid or attempt to manipulate the unions in the process of asserting management's right to manage (Holloway 1987). In these new locations there is often a dearth of work so that an intensive screening procedure can be conducted before taking on any new employees. Such screening can also be directed to foster an ideology of extreme individualism with individually negotiated contracts and a conservative lifestyle that is highly privatised (Watkins 1991). The green-field sites also offer entrepreneurs the chance to avoid those local councils which are likely to increase taxes on commercial and industrial land, readjust zoning regulations or bring in tighter pollution controls.

On those sites in which work does become increasingly standardised, such as is experienced by the operatives in semiconductor assembly, the production processes are moved on. They are shifted from the now relatively high land and labour costs of the original growth centres and relocated or

subcontracted out to peripheral manufacturing areas found in the developing countries of Asia and the Americas. Accordingly, the new high technology growth centres of the USA sunbelt have not only expanded rapidly, but have also been brought directly into the new spatial and international division of labour via their interconnections to dependent branch plants, subcontractor and input suppliers scattered over various parts of the world system (Scott & Storper 1987, p. 228).

These new spatial and international divisions of labour have given rise to a perception of a new model of the flexible firm. In particular, this conception of the flexible firm has been developed by Atkinson (1984) to explain strategies adopted by employers to become more flexible. He suggests that employers are seeking three kinds of flexibility—functional flexibility, numerical flexibility and financial flexibility. *Functional flexibility* infers that employees will be able to be redeployed quickly and easily among a number of activities and tasks. *Numerical flexibility* gives the employers the option of taking on or discarding workers as demand requires. *Financial flexibility* has two dimensions: first, that costs reflect the supply and demand inherent in the labour market; and second, that remuneration systems enhance the functional and numerical flexibility of the firm (Atkinson 1984, p. 27). But one of the effects of this quest for financial flexibility appears to have been the generation of marked wage and income polarisation within Western economies (see Harrison & Bluestone 1988, 1989; Watkins 1989a).

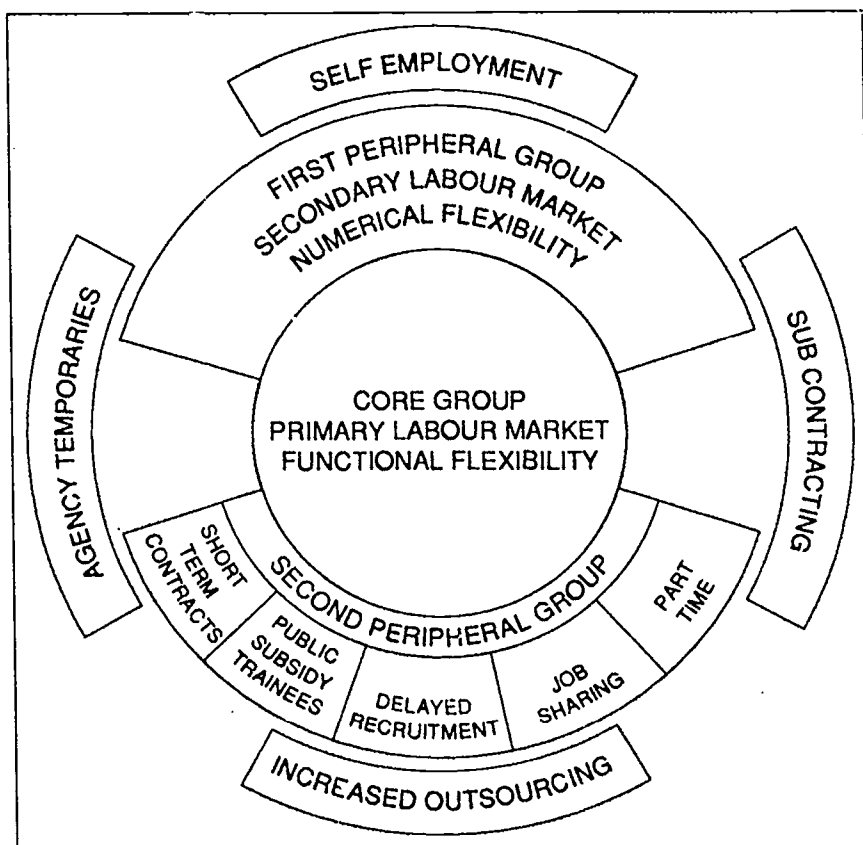
Atkinson's notion of the flexible firm can be further linked to the segmentation of the labour market. Part-time and temporary workers (overwhelmingly women) provide companies with numerical flexibility and can be seen as part of the peripheral labour market. Inclusion in this part of the labour market means that the services (of, for example, emergency teachers or temporary bank-tellers) can be called upon by institutions or firms as fluctuations in the workload occur. But these workers are not usually permanent employees and incur no 'on costs' such as sick leave, long-service leave or recreation leave. People in this situation contrast with workers who are located in the core labour market, where benefits are more forthcoming. Workers in the core labour market are permanent employees but because they are expected to perform whatever duties are demanded of them, they can be termed, in Atkinson's model, as functionally flexible—that is, they are expected to be flexible, broad-banded or multiskilled in the functions they perform.

Atkinson's model has been criticised on a number of grounds. Pollert (1988) argues that the model appears to be merely a repackaging of former theories of labour markets. In doing this the model:

makes no attempt to distinguish what may be new, from existing labour market segmentation by gender, race and age, and from the

continuation of a wide repertoire of management strategies, including lowering labour costs, rationalization and productivity bargaining. (Pollert 1988, p. 310)

Figure 1 The flexible firm



Source: J. Atkinson, 'Manpower strategies for flexible organisations', *Personnel Management*, August, 1984, p. 29.

Moreover, Pollert (p. 308) points to the fact that it is the public sector which is in the vanguard in restructuring its operations along the lines of the flexible firm. Walby (1989) links the two former points by highlighting the gendered nature of Atkinson's model. She is concerned as to whether the model accurately represents the actual sexual division of the labour market. She concludes that in this new quest for flexibility 'the wages gap between women and men has not closed. Employment is not less segregated by sex to any significant degree' (Walby 1989, p. 140). Finally, Wood (1989a, p. 7)

suggests that the overall perception and thrust by management toward a flexible firm has been overexaggerated. Managers have other concerns and forces impinging on them so that they may indeed be looking at ways to make their work force multiskilled or to bring in more temporary and part-time workers without encompassing all the dimensions of the flexible firm.

Flexible technology

The application of high technology, particularly computer and robotic technology, has facilitated the fragmentation of production into separate disparate units. It is envisaged that these new technologies will lead to higher quality products with less physical and material input required in shorter production chains. The resultant products will be able to be produced in smaller facilities with lower overhead costs and inventories and in a more flexible way utilising the latest in information technology and electronic terminals.

While these new technologies offer the scope for increased worker involvement and autonomy, they also provide employers with the basis for a new comprehensive means of controlling the work force (see ACTU 1987; Mathews 1988). The use of work teams, in conjunction with flexible automation, computerised data control techniques and other processes, not only internalises the control functions of the workplace but also, importantly, reduces costs by rationalising away jobs where overseeing and checking are of prime importance.

Rinehart (1986) has recently highlighted this use of flexible technology in a discussion of the development by Olivetti of computerised subassembly islands instead of conveyor belts. Subassembly work stations consist of four to six workers who have been integrated by electronic equipment into assembly islands which can respond with greater flexibility to the constantly fluctuating demands and innovations of the area. In these islands, workers learn each other's work, inspect the quality of the work and cover for missing and absent workers. The use of flexible technology and work techniques who greatly increased Olivetti's profitability as workers placed in more flexible situations can absorb changes and can incorporate modifications decreed by management more quickly than when working on the assembly line. Another important consideration, in this use of flexible technology is that the wages of the production workers are much lower than those of supervisors, inspectors and various other middle managers who are no longer needed once the element of control becomes inherent in the group. Last, money is saved by the company because of not having to replace absent workers. The usually disastrous effect of absenteeism on mass production conveyor belts is safely negated. This is achieved through the group being able to cope with all aspects of the

flexible, electronic equipment of their work island and so having the ability to cover for any missing coworkers (Rinehart 1986, p. 512).

Similarly, the organisation of teams was also central to the attempt to incorporate Japanese-style flexibility into Lucas Electrical in Great Britain (Turnbull 1986). A range of flexible operations was written into the job description for the groups, fostering a sense of team motivation and allowing the elimination of many inspection and support functions (see also Watkins 1989b).

Holloway (1987) has studied the use of flexible technology in the new Nissan plant in Sunderland, England. This study also emphasises the demise of middle managers and traditional supervisors. The use of the new flexible technology has meant that many of the problems of control in the car industry have been taken away from direct supervisors who had overseen the performance of the workers. In their place, control has been incorporated in the way the technology (e.g. multiwelders and robots) is designed and programmed. Indeed, in the car industry one flexible industrial robot operating for two shifts replaces about six workers. While some (ASTEC 1987b) may see that the flexibility achieved by technology such as robots will demand higher skills from the workers, a recent study by Windolf (1985) does not appear to support that claim. He comments that:

whether new technology inverts the trend towards deskilling of production workers remains to be seen. This study does not lend much support to the vision of 'integrated work' and the 'end of Taylorism.' The negative effects of industrial robots on skills, income, and employment of production workers that were observed in the three German motor car plants still seem to dominate, not the tendency toward reskilling of jobs. (Windolf 1985, p. 492)

Moreover, the new flexible electronic technologies permit large corporations to not only disintegrate unwieldy concentrations but also to manage effectively and administer these decentralised units. Through the use of these flexible technologies decentralised activities can be coordinated as if they were centralised, with flexibility being achieved but with a minimum loss of control. Furthermore, in a political context, this trend toward disintegration, flexibility and deregulation fits in neatly with the New Right ideologies of the former Reagan and Thatcher governments. An important factor to their minds is that the disadvantages of large groups of workers being brought together are avoided. As Kenneth Baker, outlining Thatcher's industrial strategy promoting flexibility, has stressed, 'huge places of work, where the individual is swamped, are de-humanising and it is not surprising that they become the breeding ground of militant aggravation' (Baker quoted in Webster & Robins 1986, p. 325). Smaller,

compact plants using the latest computer technology not only make it more difficult for unions to organise but, as control is increasingly internalised, top management is allowed to get on with the more pressing entrepreneurial tasks of enhancing company profitability.

Flexible labour

One aspect of the current move toward greater flexibility is what has been termed the 'demassification' of work (Webster & Robbins 1986). Vertical integration, as typified by Fordist and Taylorist managerial practices, carries with it internal economies of scope. This means that the division of labour even when highly fragmented and technically specialised can be managed more cost effectively, and consequently cheaply, under a centralised managerial hierarchy. However, once these internal economies of scope start to have negative consequences through the increasing, inherent trend toward extreme forms of alienation, then it may be more profitable for management to break up the fragmented labour processes into specialised, separate firms. As Littler rightly notes:

In practice, directly employed labour can represent an undercutting of employer control, because of unionisation, work-group influence and state agencies imposing regulations and minimum standards. (Littler 1990, p. 67)

The large corporations, then, see it as more expedient to contract work out to smaller peripheral, subcontracting organisations. Not only is the problem of worker alienation lessened but also an additional advantage is that it will make trade unions more difficult to organise and so hopefully gradually break down their power. As Sir Alan Cadbury has observed recently, the 'trend is not because small is beautiful but because big is expensive and inflexible' (Cadbury quoted in Webster & Robins 1986, p. 324).

This small vision of production sees flexible labour linked to the development of the 'electronic cottage'. In this situation the home is the focal point of paid labour, with the flexibility inherent in electronic work processes bringing 'a return to cottage industry on a new, higher, electronic basis, and with it a new emphasis on the home as the center of society' (Toffler 1980, p. 210). In a workplace, which is also the family home, the time distinction between leisure, paid work and family tasks can be eroded and made to merge into one another. Time devoted to the work subcontracted out from the larger organisation is restructured on a flexible and individualised basis. Forester (1988), however, has highlighted the overoptimistic scenario painted by the advocates of the 'electronic cottage'. He concludes that the:

theorists of the electronic cottage have failed to recognize that technological change is not always followed automatically by social change. (Forester 1988, p. 232)

Nelson (1986), nevertheless, has done an empirical study of the powerful trend toward the suburbanisation of low-wage office work in the USA. The increasing electronic automation of office work with the complex linking of often widely dispersed electronic terminals has allowed work such as payroll billing, credit card services and centralised word processing to be relocated in smaller outer suburban offices. This trend utilises the flexibility of a large reservoir of middle-income, white, suburban females who are usually well educated but conservative with similar values and ideological positions to their employers. Such labour is not only highly flexible and productive, but also resistant to militancy and unionism. In this regard:

suburban communities aimed at young, growing families are thus the best place for employers to find women whose primary responsibilities lie in the household, but who are eager for alternative employment that can be fit around domestic duties. (Nelson 1986, p. 158)

Nelson has found that there are a number of consequences which result from the disintegration of office work from central to peripheral locations. First, there has been the transfer of these jobs from the low-income minority-group female workers located near the central city to white suburban females from middle-income households. Second, the suburbanisation of office work brings with it a significant lowering of labour costs through reduced turnover, a decrease in the time for training, increased productivity, a longer working day and little chance of unionisation (Nelson 1986, p. 165).

Mitter (1986) in Great Britain and Peck (1990) in Australia point to a similar trend toward the home in the garment industry where home working has become crucial in the flexible organisation of work. In the quest for greater flexibility, access to a captive, disposable and essentially female work force is part of the overall strategy for reducing costs. In particular, in contrast to Nelson, Mitter suggests that it is the ethnic women who form the main target for subcontractors in their recruitment of a docile, nonunionised, flexible labour force. Moreover, within this group there is a marked shift with work being transferred from the factory to the home. For instance, about twenty thousand women within London's Cypriot community are employed in the clothing industry. However, between 1979 and 1984 the percentages of home workers to factory workers have moved from forty per cent to sixty per cent (Mitter 1986, p. 59). Moreover, in this

subcontracted work there is clearly a gendered division of labour with the women doing the unskilled, repetitive, machining work usually from home. The small number of men involved in home working, on the other hand, are engaged in entrepreneurial and managerial activities.

Fincher's (1989, 1990) research into class and gender relations in Melbourne indicates a similar trend to that of Great Britain and the USA toward home working. Statistics in the early 1980s revealed that ten per cent of the women recorded as part of the paid labour force put down their home as their workplace. Through the development of a more flexible work force, the women involved find that: 'the class and gender relations of home and workplace do not merely influence each other, but are utterly, spatially intertwined' (Fincher 1989, p. 101). Here, as in Great Britain, there is a gendered division of labour with the quality and status of the home working undertaken by women in Melbourne being much lower than the home working in which men engage.

Walby (1989, p. 129) has directly asked such questions as: Is flexibility gendered? Is the 'core' masculine and the 'periphery' feminine? Is 'flexibilisation' 'feminisation', given the increase in the 'flexible' part-time female work force? She concludes that the gendered basis of many of the moves toward greater flexibility is not simply a reflection of a short-term, local phenomenon, but rather an important facet in the global restructuring of capital. The burgeoning numbers of women in part-time, temporary jobs, providing employers with greater numerical flexibility is part, she argues, of 'a long-term restructuring of the gender composition of the workforce' (Walby 1989, p. 140). In the course of this development, the resulting sexual division of the labour market has been paralleled by a change in the valuation of work: women's work becoming devalued in the periphery while male work in the core increases in value. But, as can be seen from these studies, different local labour markets can impinge on women from different ethnic and class backgrounds in a range of ways. While the road to a post-Fordist flexible future may be part of the global restructuring of capital, there are different paths to that road, reflecting local specificities with regard to the balances of class, gender and race (Jessop 1988). However, the neglect of any research into the place of women as part of a new flexible work force has led Jenson (1989) to point out that the dominant literature on the subject is gender-blind. Piore and Sabel in particular are highlighted as being oblivious to the gender implications of the definition of skill, the distribution of jobs and the value placed on jobs. In their minds any sex differentiation in the work force does not exist rather, 'all the real workers are like men: gender, race or nationality enter into the analysis only to explain divergences from the norm' (Jenson 1989, p. 144). Jenson argues that flexibility is continuing to devalue the skills of women in a way which will

reinforce and even worsen the unequal construction of gender relations in the work force.

A recent study by Horrell, Rubery and Burchell (1989) into the undervaluation of women's jobs and the associated problem of restricted access into core occupations reinforces the debate just outlined. They found that merely improving the skill or job content of women's jobs could not be relied upon to increase their average wages. The most important consideration for women was:

not gaining access to skilled jobs but either gaining access to jobs where the pay is linked to scales which reflect the expected earnings of male workers or alternatively using equal value claims to transform the pay scales of women's jobs. (Horrell, Rubery & Burchell 1989, p. 190)

However, such action becomes difficult with the increasing feminisation of part-time and temporary work where women are at the forefront of the restructuring process and are playing a crucial role in the way capital is being reorganised (West 1990, p. 264). The resulting gendered divisions of work not only discriminate against the value of work but also tend to isolate the segments of the work force within a patriarchal power structure (see Steinberg 1990).

But even where work has remained on a large, centralised scale with a high degree of permanency, the flexibility of workers is a major concern of management. One of the prime models put forward in this context is the Japanese approach that stresses such things as work rotation, job redesign, quality circles and other practices to reduce the effects of alienation manifest in more traditional work situations. The thrust of these practices is to promote a higher level of worker flexibility. The emphasis on flexibility means that there is less concern for highly specific work skills as each worker is expected to perform a variety of the tasks that are required to maintain production in a particular area. The breaking down of demarcation areas in the workplace means that the employer is able to make more productive and profitable use of the worker through the resulting increased flexibility. To enhance the move toward flexibility, employers also claim that the work conditions are improved as the monotony and consequent alienation of much of the work is reduced. The flexible work practices expected when a firm has invested in new, expensive flexible technologies and work organisation can be illustrated by a Ford worker's description of flexibility after the Japanisation of the plant at Dagenham, England:

Flexibility means that every 102 seconds a car comes by, and not only do you have to screw something into the car, but in between you have to tidy up, check your tools, repair things and check you've got enough parts. You do not have a single job any more. If there is no work on the

line they move you to where there is work. You are working the whole time. (cited in Tomaney 1990, p. 46)

Similarly Sayer reporting on the situation in Japan states that: workers are trained to switch between jobs as and where needed, under their own discretion, helping fellow workers who are overloaded. Alternatively, workers may carry out a fixed cycle of different operations: Suzaki reports the case of a Toyota worker who handled 35 different production processes in a cycle lasting 8 minutes and 26 seconds (plus or minus 2 seconds) and who walked 6 miles a day in the process! (Sayer 1986, pp. 52-3)

He concluded that an additional benefit to management is that such flexibility clearly indicates those jobs which do not require constant attention and so reduces the amount of idle time in the production process. Turnbull (1988), however, reports that from the workers' viewpoint this increase in flexibility has not led to any significant reskilling or skill enhancement. For one worker, the introduction of the just-in-time approach and other Japanese flexible strategies into Lucas Electrical (Great Britain) merely resulted in the fact that, 'the jobs are just the same as before, you just do more of "em"' (1988, p. 12). Nevertheless, it is the Japanese methods of work organisation that are held up as the model to copy. For instance, the recent report *The Global Challenge: Australian Manufacturing in the 1990s* (Australian Manufacturing Council 1990) postulates on the 'new workplace culture' that is currently being installed around the world but owes its origins to the Japanese. Australia then, it argues, needs to modernise its 'workplace culture to achieve greater productivity, to generate and reward skills more effectively, to increase quality and to adopt practices such as Just-in-Time' (Australian Manufacturing Council 1990, p. 57). Consequently, it would be wise to spend some time on a closer examination of the way work is organised in Japan.

The organisation of work in Japan: The flexible future?

It should be apparent from much of the preceding discussion in this monograph that Japan is held up as the flexible model that Western industry needs to copy if it is to survive. Piore and Sabel (1984), for example, argue that through the installation of lifelong employment, promotion based on seniority, multiskilling and worker consultation Japanese production processes saw a re-emergence of a craft paradigm that is taking the

place of the Fordist mass production model. Similarly Sugimoto (1990) has noted that not only have Westerners enthused over the Japanese approach but that it is now fashionable for the new generation of social scientists in Japan to promote the idea of 'Japan as a postmodern society trailblazing ahead of most Western societies' (Sugimoto 1990, p. 14). In the light of such enthusiasm it would be prudent to look at several aspects of the Japanese production process:

- 1 the dual nature of the labour market;
- 2 the gendered nature of the labour market; and
- 3 innovations like the just-in-time approach to the organisation of work.

A dual labour market

Japan's labour market is characterised by large industrial giants feeding off a myriad subcontractors. Lifetime employment has been seen as one of the exchanges through which the core workers in the large firms accept loyalty and flexibility of job tasks along with seniority-based wages and compliant enterprise unions (see Kumazawa & Yamada 1989). However, people in this situation comprise only about thirty per cent of the Japanese work force. Firms employing between one hundred and one thousand workers account for about sixteen per cent of all jobs, while firms employing over one thousand workers account for another fifteen per cent. The other approximately seventy per cent of workers are not part of this lifetime employment exchange (Wolferen 1989, p. 170). To keep up the guarantee of lifetime employment, the large Japanese firms engage in a number of strategies such as encouraging early retirement, giving employees trivial jobs to perform or transferring workers to subsidiaries or supplier firms. However, this latter process may force these firms 'to lay off their own employees to accommodate "imports" from the parent who may be less competent, equipped, or even interested in holding the jobs' (Sethi, Namiki & Swanson 1984, p. 37). While these subcontractors may not all be direct subsidiaries of the larger firms they are tied economically and financially to them. Employees in these small firms make up almost the fifty per cent of Japan's work force working in factories of less than fifty workers with over twenty-nine per cent of the labour force in family and self-employed work. Although these small firms are theoretically independent, in practice the great majority are dependent on one of the giants. In this context, as Wolferen explains:

much is made of the family metaphor. The 'parent firm' helps the subcontractor with supplies and technical assistance, including in-

vestments in machinery. It will not, under normal conditions, turn to cheaper subcontractors. But the 'child firm' must accept its role as shock-absorber in periods of economic downturn. (Wolferen 1989, p. 171)

Littler (1980, 1982) has pointed to the historical background of this relationship through the development of the Oyakata system. This was a patriarchal practice based on the father (oya) – child (ko) relation. The Oyakata were contracted by employers to recruit labour, set up the work and meet the deadlines. Even where work practices became more centralised the family ethos continued in the flexibility and indirect control of subcontracting.

Flexibility in the production process has continued to be attained through the subordination of small firms to large ones through the subcontractual networking system. In such relationships it is important to keep in mind the forgotten dimensions of power and control that allow the flexibility of the large Japanese firms.

Gender and the labour market

Briggs (1988) argues that women, compared to men, suffer discrimination in virtually all areas of employment in Japan. Indeed, Sugimoto (1990) cites a comparative cross-national study on the status of women in ninety-nine countries which found that Japan with a ranking of thirty-four was the lowest among industrialised countries. Reflecting this finding, Kumazawa and Yamada (1989) report that women are virtually excluded from the core sector with its lifetime employment. This means that they mainly perform assistance jobs for men in white-collar positions or unskilled or semi-skilled work on the shop floor. On the arrival of any children they are pressured to retire, while 'those women who fail to find a husband within a "suitable" period following graduation will find few companies willing to consider offering promotion' (Briggs 1988, p. 25). Rather, there is considerable pressure on young women to either marry or 'voluntarily' leave the company. For unless she works in traditional female employment like teaching or banking 'a female employee approaching the age of twenty-nine will have to find a husband or an alternative source of income' (Wolferen 1989, p. 173). If, on the other hand, after having children women returns to work, they:

cannot claim seniority in the way that the men can under the 'lifetime employment' system, and are typically employed on a 'part-time' basis though they may work as many hours as their male colleagues at half the pay, and with few if any fringe benefits. (Wolferen 1989, p. 172)

As a consequence a large fraction of the female work force, 20.8 per cent, work at home (Hill 1990, p. 144). But, as more than half of the women who are married supplement the family income through working (mostly subcontracting firms), Japan's industry is furnished with a large pool of relatively cheap labour thus enhancing its flexibility. The trend increasingly to use married women on the assembly lines of particularly those industries involved in the manufacture of electrical goods is paralleled by the expansion of part-time employment as previously skilled tasks can now be undertaken by less skilled workers (Kumazawa & Yamada 1989). Sethi, Namiki and Swanson (1984) report that more than two-thirds of these part-time workers are women who may work up to seven hours, or even more, a day in some jobs. However, they receive as Wolferen has indicated, only a fraction of the full-time pay and none of the company benefits offered to permanent employees.

Just-in-time

The just-in-time production system was promoted and developed by the Toyota company. Just-in-time basically means to produce the necessary units in the necessary quantities at the necessary time (Monden 1981, p. 36). This process reverses the policy of having large quantities of stocks in reserve which was part of the just-in-case approach. Therefore, a key target of management is progressively to reduce buffer stocks to zero along with the elimination of all errors and any rejects. As Sayer (1986) sums up:

the JIC system is a method of mass production based on a collection of large lot production processes separated by large buffers and feeding into a final assembly line, JIT is a system of mass production consisting of a highly integrated series of small lot production processes. (Sayer 1986, p. 56)

Tied into this process is the need to train workers to carry out a range of tasks and to widen their duties, reducing their specialisation but increasing their responsibilities. This trend involves indoctrination of the correct 'behavioural skills', with firms being very careful in their selection of staff. This has been illustrated by the selection processes of Nissan in their new plant in Sunderland, England where it was obvious that recruitment and the actual hiring decision depended on a show of loyalty and identification with the company (Crowther & Garrahan 1988, p. 57). These and other techniques (e.g. work-teams and quality circles) are seen as important in securing increased worker flexibility, increased intensity in the use of capital equipment and greater continuity of the production process. As such, Sayer observes that these techniques 'could be said to involve the

internalisation of Taylorism by workers themselves' (1986, p. 68). The result, though, may not be welcomed by people who have to work under increasingly intensive conditions with little space for their own autonomy. Just-in-time can be viewed as continual intensification of the work process where:

perfection means the continuous rationalization of production, operating the manufacturing process with ever fewer workers upon whom the costs of production fluctuations and the burdens of productivity improvement are concentrated. (Turnbull, 1988, p. 11)

This continual search for perfection is termed *Kaizen*. As Wood explains:

in the auto industry, management will run a line at a certain speed until a problem arises, and then stop the line and have discussions involving relevant workers until the problem is overcome. They then run the line at the same or even greater speed until another problem arises, which they again discuss, and the cycle continues. (Wood 1989b, p. 451)

Such a strategy incorporates the ongoing appropriation of workers' knowledge whereby workers on the line are socialised to think as if they were industrial engineers. Through this process they bring about their own work intensification. A result is that in recent years, a term *Karoshi*, meaning excessive work deaths, has been coined and widely used to describe the increasing number of workers who have died because of Japanese work practices (Sugimoto 1990, p. 18). Indeed, Turnbull reports that suicide is now one of the most popular ways to escape the Japanese workplace (1988, p. 18).

Educating the flexible worker

It seems strange that while much of the literature and many empirical studies emphasise that one of the attractions of greater flexibility for employers is the reduction of union power, the Australian Council of Trade Unions (ACTU) seems also to be a fervent advocate of flexibility. In particular the theme of organisational flexibility through new high technology which in turn requires a more skilled, highly flexible, educated work force constantly reappears in the volume *Australia Reconstructed* (1987). Thus in acquiring organisational flexibility:

The introduction of new technology requires constant training and retraining in specific knowledge and skill areas and in more broadly based abilities. (ACTU 1987, p. 116)

Australia's future 'international competitiveness' and place in world markets is dependent on an education sector which is able to respond to the high skill needs of new technology and which is more flexible in responding to the needs of the labour market (ACTU 1987, p. 119). Another facet of this policy is the retraining of workers who have become or are *about to become* redundant or retrenched (ACTU 1987, p. 123). As a consequence, the document argues, in the formal education system 'the emphasis must be on increased flexibility and on providing an appropriate level and range of skills' (ACTU 1987, p. 124). Through educating young people in this way:

the essential links which ensure a better matching of economic priorities on the one hand, and, education/training priorities on the other, can be built and maintained. (ACTU 1987, p. 124)

But it is emphasised that skill education is not a 'one-off' occurrence. If Australia is to improve its position in the world economy then there is a need to recognise that 'new technologies and new ways of organising work require skills upgrading and development throughout a person's working life' (ACTU 1987, p. 123).

Interestingly enough, the recent Business Council of Australia (BCA) paper 'Policies for skill formation' (1988), presents a similar argument with regard to flexibility, skills and education to that presented by the ACTU. Thus, it argues that, in order for Australia to prosper and grow, higher premiums will have to be placed on new flexible work design, organisation and practice. All of these, in turn, put a premium on greater employee involvement and skill formation (BCA 1988, p. 4). For education such changes will need a 're-examination of our skill training system, policies and practices' (BCA 1988, p. 4). But the paper warns that any additional investment in skill education can only be of benefit if it results 'from a combination of restructured classification *and* more flexible work organisation and practices' (BCA 1988, p. 10). As an example the BCA cites ALCOA, which has benefited from 'a more skilled, flexible and efficient workforce, working in an environment which is less inhibited by demarcation and other rigidities' (BCA 1988, p. 8).

There are, however, important differences between the views of the BCA and those of the ACTU. First, there is disagreement over who will fund any programs. Second, the BCA's vision of flexibility envisages breaking down rigid work practices, wage rates and union influences, while, the ACTU's vision of flexibility is seen as allowing the creative powers of the workers to be utilised in the workplace. Nevertheless, they both see education as being strongly vocational, closely tying education to the workplace. In presenting this view of education they both embrace the rhetoric of human capital theory, as do the other political documents

outlined at the beginning of this monograph. Consequently, it is important to look at this shift toward human capital theory in a little more detail.

Education and training in the national interest: The resurgence of human capital theory

The basis of human capital was developed by Schultz (1961) and Becker (1964) who developed a neoclassical view of the labour market which put the case that skills are embodied in individuals in such a way that they develop a type of human capital. The concept of human capital entails a dual perspective. From one point of view society can be seen as investing in human capital to increase economic growth. From another point of view the individual can be seen as investing in education to increase personal income. If education is not seen from this angle, Schultz argues, we fail to understand that:

laborers have become capitalists not from a diffusion of the ownership of corporation stocks, as folklore would have it, but from the acquisition of knowledge and skill that have economic value. (Schultz 1978, p. 314)

According to this theory, educated workers supply employers with human capital to increase productivity. In this way, it can be claimed that education is positively correlated with marginal productivity and thus rewarded correspondingly in the form of higher wages. Thus, the use of human capital theory entails both the explicit and implicit belief that the major components of productivity under modern technological conditions are cognitive skills, the ability to learn and technical skills. As Karabel and Halsey (1978) point out, this ideology is in harmony with the technological functionalism and utilitarian values of the classical nineteenth-century economists. It combines the technical function of education with the efficient use of human resources. In addition, because human capital theory considers people as objects, which can be improved like physical capital, it supports the liberal idea of equality of opportunity (Spring 1980), and the investment of individual and corporate profits (via the public education system) in human capital development (via education).

The human capital approach has also been discredited by the failure of both the 'War on poverty' and evidence from the third world (Karabel & Halsey 1978). Bluestone has argued, for instance, that the comparative failure of the human capital theory in alleviating poverty lay in its neglect of the structure of the economy (1978, p. 335). He suggests that:

For many of the low-paid, low wages are not due to lack of education or human capital. Low wages are mainly the result of entrapment in low-wage, nondurable, manufacturing firms, retail-trade establish-

ments, service industries, and, to some extent, wholesale trade ... the major problem is the total lack of good jobs. (Bluestone 1978, p. 339)

Moreover, Carnoy (1980), in an extensive review of the empirical evidence, concludes that all the evidence is:

compatible with a theory which acknowledges that employers in the absence of any low-cost method of determining an employee's potential productivity use easily observable personal characteristics such as schooling, race and sex to prejudge productive ability. (Carnoy 1980, p. 24)

These aspects are developed by Hirsch (1980) who points out that there are at least two social problems that the neoclassical theory has difficulty in explaining. First, the explanation that poverty is caused by lack of skills or training has fallen into disrepute because the huge investments in education and training programs for the poor have not made a significant difference to the degree of poverty in society. Second, he argues that the theory cannot explain the presence of discrimination based on race and sex in the labour market. For example, it cannot explain why women with identical skills and training as men receive less money and have a lower status in the labour market.

Further, the equalisation of educational achievement throughout the Western world has not led to a comparable equalisation of earnings. Consequently, as Levin (1984) indicates:

the ostensible failure of human capital theory to predict the effect of changes in the distribution of education on the distribution of earnings has been a major reason for recent challenges to human capital theory. (Levin 1984, p. 11)

Yet, despite such reservations, we find the human capital view being continually expounded in documents relating to education, training and work. But such a heavy emphasis on human capital theory needs to be removed, particularly at a time when the more equitable and socially just development of people is being advocated through the implementation of equal employment opportunity legislation, affirmative action programs and equal pay campaigns (Strober 1990).

Nevertheless, increased skill education and skill training in the development of more complex skills are advocated in numerous documents as they are seen to enable workers to implement better the increasingly complicated technology being introduced into the workplace. But as Rumberger (1987, p. 76) points out, apart from some work in agriculture there is virtually no empirical evidence to support such a proposition.

Further, Rumberger distinguishes between the skills that workers have been educated in and the skills required by the work they are asked to perform. Indeed, he suggests that 'the two may not be the same' (1987, p. 77). This consequence may result from using higher levels of skill attainment to sift out workers applying for a job. Higher levels of education may also be preferred because the costs of on-the-job training are reduced. Furthermore, the relationship of the supply of workers to jobs may mean a discrepancy in the skill level of the workers and the jobs.

Human capital theory has become so ingrained in any literature relating to education and work that the ideology espoused is taken as commonsense and viewed uncritically. Maglen (1990), however, has sought to scrutinise the evidence on which human capital theory is founded. His findings indicate that, first, on a macro-economic level any link between education and economic growth is not substantiated and, further, that micro-economic level analysis yields similar results. He concludes that:

if the basic tenet that education enhances worker productivity remains unproven, then the whole role of education in the economic growth and development process is cast into doubt. (Maglen 1990, p. 292)

Linked to the human capital perspective has been the quite overt, even celebrated, claim that education should closely respond to the needs of industry. Indeed, in the federal government's policy documents referred to earlier in this monograph, it is stressed that education and training should not only respond to the needs of industry but should be an active tool in the restructuring process involved in the federal government's micro-economic reforms. While some, Bates et al. (1984), have termed this the 'new vocationalism', historians such as Violas (1978, 1981) and Blackmore (1987) argue that such a view of education has a long historical heritage. As Blackmore, for instance, has clearly shown in her discussion of vocational education in Victoria between 1935 and 1960:

twentieth-century educational rhetoric in Australia assumed the human capital argument that schools could and should produce skilled employees capable of meeting the demands of an increasingly complex and technologically advanced workplace. (Blackmore 1987, p. 31)

Central to the instrumental view of vocational education is the assumption that education and training can operate as a means of social control whereby people are fitted in the most efficient manner into the industrial and corporate sector. This is clearly the perspective underlying the proposal that the products of the education system should be adaptable and flexible so that they can respond harmoniously to the rapid rate of technological change and market fluctuations experienced by industry.

The emphasis in this argument is on transforming people to enhance productivity and profitability rather than on transforming technology and the workplace to promote such concerns as intellectual development, equity and social well-being.

Violas sums up the movement toward vocational education in the first half of this century by pointing out that:

The vocational guidance movement reflected the general direction of liberal social philosophy in moving away from coercion to more subtle and effective kinds of social control. Rather than impose industry's will by command or exhortation, the new techniques relied upon the internalization of goals and ideals which had been previously selected by experts. At times, individuals were even allowed to choose their own goals—if these were acceptable to the professionals. (Violas 1978, p. 216)

Thus, if we are to take heed of the assertions of employers and politicians that vocational education is required to satisfy the needs of society, we must ask whose needs are being satisfied. First, greater profit can be achieved by the transfer of much of the cost of on-the-job training to the various facets of the education system. Second, the basic questions about the way work is organised and the choices involved are unanswered as young people are socialised and trained for a workplace seen as unproblematic (Watkins 1987). Third, the position the student attains within the labour market, with its inequalities of status and reward, is seen as a reflection on the individual abilities of the student.

The benefits of vocational education should be considered in ideological terms because in terms of students achieving the goal of acquiring the jobs for which they have been trained, the evidence suggests that vocational education is a failure. For as Kantor and Tyack have written in a recent, important book, *Work, Youth and Schooling: Historical Perspectives on Vocationalism in American Education* (1982):

during the last fifty years, major evaluations of vocational programs have repeatedly questioned the benefits of vocational training. Although some studies have found that vocational graduates have lower unemployment and receive higher wages than other comparable students, the majority of studies have concluded that there is little economic advantage to vocational training, as opposed to non-vocational, at the high school level. (Kantor & Tyack 1982, p. 2)

Meyer and Wise's research (1982) supports the general argument put forward by Kantor and Tyack. They found that there was 'no measure of high school vocational or industrial training that was significantly related to employment or wage rates after graduation' (Meyer & Wise 1982, p. 307).

While the rhetoric and ideology of efficiency has influenced educators to link vocational programs to the ability to move easily into the work force and to be 'trained for the job' more proficiently, Meyer and Wise found that this was not the case. Instead, their research suggested that vocational training in high schools would seem to bear no relationship to the jobs students eventually obtain and their wage rates. But such reservations fall on deaf ears when the vision of high technology training is conjured up to ease parents' fears for their children's future. Thus, while the direct instrumental value of vocational training is dubious at best, as Kliebard (1990) points out, it is the ideological justification of education and training in occupational terms that currently has great strength.

High technology and education

An important assumption underlying the arguments in the various documents discussed in this monograph is that the development of high technology industries will require large numbers of highly skilled workers. They suggest that schools and training institutions like TAFE will have to respond to the needs of the new high technology workplace by producing students who can design, develop and use the new high technology being introduced into the factory and the office.

But such visions of the new high technology workplace seem ignorant of a number of research reports about what is actually happening in the workplace and the labour market. Even Hoyt, a leading training and vocational educator, has concluded from the recent work of researchers such as Levin, Rumberger and Kirkland that 'it seems unlikely that high technology will have great impact on the basic nature of the occupational society at least up to the year 2000' (Hoyt 1987, p. 277).

Using the US Bureau of Labor statistics estimate, Levin and Rumberger (1983) and Rumberger and Levin (1985) suggest that while most industries related to high technology will indeed be undergoing rapid rates of growth, this will entail only a small percentage of new jobs. In fact their projections indicate 'that high-technology industries will provide only three to eight percent of the new jobs in the future economy' (Rumberger & Levin 1985, p. 411).

Rumberger and Levin (1985) suggest that much of what is written about high technology and education today is based on a number of misconceptions. They argue that, first, high technology industries have been confused with high technology occupations. Indeed, many of the occupations found in high technology industries require few skills and command below-average wages. This trend has become so pronounced that many of the production line jobs in the computer industry have

illustrated their flexibility and are now being disintegrated and exported out of Silicon Valley to Asian cities where female workers with little training and much lower wages perform the repetitive tasks (see Siegal 1979; Scott 1987; Scott & Angel 1988). In this respect Asian assemblers' hourly wages vary from about the \$8.37 of the US norm to Indonesia with \$0.35, and \$1.58 in Hong Kong (Scott & Angel 1988, p. 1954). Rumberger and Levin (1985) estimate that less than a quarter of the jobs in high technology industries are high technology jobs. They also argue that the rapid growth in high technology occupations does not in reality translate into large numbers of workers. This is because compared to most of the traditional areas of employment (e.g. car manufacture) these new occupations employ relatively few workers.

Finally, Rumberger and Levin point out that, while in the past jobs lost due to the introduction of new technology have been eventually regained due to the displacement of workers into expanding sectors, there is no guarantee that this can happen again. This is because high technology can be directed to take over the mental demands of work whereas previous technologies have reduced the physical demands of work. Moreover, the increasingly low cost of the new technology relative to labour costs ensures its introduction. Such trends should also be seen in terms of most corporate enterprises which have a global content, being able flexibly to move their production lines and resource demands at will throughout the world, while many Asian and Latin American countries compete to provide low taxes, amenities and a lowly paid, docile, nonunionised labour force (see Scott 1987; Scott & Angel 1988).

Rumberger and Levin, through their examination of the US Bureau of Labor Statistics, found that while there would be growth in the high technology occupations, by far the greatest area of job creation would be in the very low-skill clerical and service occupations. As they put it:

This picture is further reinforced by examination of individual high technology job categories. While jobs for computer systems analysts will increase by over 100 percent between 1978 and 1990, only 200,000 new jobs will be created. In contrast, there will be over 600,000 new jobs for janitors and sextons. In fact, more new jobs for janitors will be created than new jobs in all the five occupations with the highest relative growth rates. Consider another example: about 150,000 new jobs for computer programmers are expected to emerge during this 12 year period, a level of growth vastly outpaced by the 800,000 new jobs expected for fast food workers and kitchen helpers. (Levin & Rumberger 1983, p. 5)

More recently Levin and Rumberger (1989) have reconfirmed such trends after they examined the projected percentage growth rates in jobs

between 1986 and 2000. While the ten fastest growing jobs are concentrated in the health and technical areas, they will only generate about four per cent of all new jobs. However, the ten occupations generating the most jobs—waiters, sales clerks, fast food workers, janitors, etc.—will contribute thirty per cent of all jobs. For instance, between 1986 and 2000 there will be two hundred and fifty-one thousand new jobs for computer systems analysts but one million, two hundred and one thousand new jobs for sales clerks and seven hundred and fifty-two thousand new jobs for waiters.

In similar vein Sweet (1987) argues that in Australia the skilled, attractive jobs for young people have declined sharply. His analysis provides no support for the commonly held view that the demand for skills is rising due to the introduction of technology. Indeed, the evidence suggests that the main effect of technology is to reduce the demand for skilled occupations. However, Sweet warns that:

A recognition that technological change will not necessarily increase the demand for skills, that in some areas there has been substantial deskilling because of the way technology has been introduced, and that many past trends reflect supply and government expenditure rather than a technological imperative, carries risks for educational policy makers. (Sweet 1987, p. 114)

A danger in arguing this way will be that those who see education as being closely tied and instrumental to the demands of the workplace will respond with calls for cuts in education spending. However, education must be relocated from such a narrow human capital agenda and placed on a more critical and reflexive agenda. A similar critical stance is required when examining the demand for the training of skills in the workplace, since here too there is frequently a discrepancy between rhetoric and reality.

Skills in the workplace

Mathews (1988), in putting an optimistic case for the development of increased flexibility, concedes that the issue of whether or not the new approach will supersede Fordism still has to be resolved (see also Campbell 1990). Indeed, Mathews rightly argues that there is:

the existence of clear choices—choices which are susceptible to the influence of governments, trade unions and employers, as well as to that of professional managers and engineers. (Mathews 1988, p. 72)

But in addition to this area of choice, it should be obvious from the work just cited that there is also a struggle over the way flexibility will be

interpreted and developed. Hyman and Streeck (1988) and Wood (1988) argue that a danger in the Fordist-flexible debate is that it frequently becomes polarised when in fact managerial strategies mesh and incorporate elements of both approaches. In presenting the extreme arguments from both sides the danger is that the 'debate is based on stereotypes of the opposing theories and becomes polarized or simply reduced to definitional questions' (Wood 1988, p. 102). Wood later (1989a) elaborates on his point by noting that:

Control and flexibility are not two ends of a single unidimensional continuum. There was considerable flexibility in Fordism—indeed central to Taylorism was the idea of workers being disposable and hence the association of routinization and low training times with numerical flexibility. (Wood 1989a, p. 28)

Even in the Swedish case studies so frequently cited by the optimists, Hyman (1989) points out that the introduction of reforms incorporating flexible approaches have had virtually no effect on the power of management in the workplace. In no way has capitalism been endangered or employer power been reduced. Any changes in the workplace are, in the wider context, only marginal reforms which do not transform the capitalist system in any significant manner.

Nevertheless, with the introduction of high technology into the workplace the commonsense response from the education and training sector seems to be a call for the production of workers who can cope with the allegedly higher order skills required of them by employers. In arguing this case, Mathews, Hall and Smith (1988) suggest that:

The education system, like other major human-service organizations, is having to respond to unprecedented levels of change in industry and the economy. Shifts in technology, in work organization and in patterns of skill formation, all provide a rapidly changing context for education. (Mathews, Hall & Smith 1988, p. 497)

Others such as Tsang and Levin (1985), Rumberger (1987) and Blackmore (1988) are more skeptical of the relationship between what is actually happening in the workplace and education and skill formation. Blackmore argues that:

First, the language of skills conflates the acquisition of menial, trivial and routinised tasks, by subdividing and labelling such tasks into 'skills' ... Secondly, by using the 'language of skills' as a justification for education, training and skilling, it 'rationalises' the connection of welfare payments to what appears to be the acquisition of skills which are supposedly beneficial to both the individual and the community ...

Thirdly, there is a merging or blurring of the notions of education and training. Education is training in that it imparts those characteristics so valued in the worker of the future—flexibility, adaptability and initiative. (Blackmore 1988, p. 35)

At this point in the debate on the acquisition of skills to meet the demands of the new high technology workplace it might be advisable to examine some empirical work on the subject. Tsang and Levin (1985) have pointed to evidence which suggests that, even in these high technology times, as the number of graduates with specialist skills is rising increasingly there is a trend to underutilise their skills in the workplace. They suggest that research indicates that many employees have more skills than are needed in the workplace and that this situation has existed over a long period of time. Moreover, while the workplace appears to be becoming more complex, with work incorporating various electronic processes, the underutilisation of skills seems to be increasing. This problem has been recently studied by Tsang (1987). He sought to examine the underutilisation of skills in a high technology industry through a study of the US Bell companies. The empirical results of Tsang's research supported the proposition that underutilisation of educational skills does occur and that a firm which does not fully utilise these skills suffers a loss in output (1987, p. 246). But in addition the underutilisation of skills is also likely to cause a high degree of worker dissatisfaction with the structure of the workplace. As a consequence, workers may be less productive in their jobs and may put in much less effort than they would if there was a closer balance between their education and training and the tasks they were asked to perform (Levin & Rumberger 1989).

In another research project Levin and Rumberger (1986) have examined the education and training needs of small businesses that have introduced computer technology into their workplaces. The continual decrease in the price of the latest electronic devices coupled with their increasing sophistication has led to a rapid increase in their utilisation by small businesses who are, in fact, the greatest employers of labour. This trend prompted Levin and Rumberger to investigate the commonly held notion that the increasingly computerised workplace necessitated a general demand for greater technological and computer literacy from those people who were about to be employed in such workplaces.

Their research findings however revealed that only sixteen per cent of employers thought mathematics skills, eight per cent prior computer experience and sixteen per cent formal computer training to be important. Employers judged that the most important category was the interest and enthusiasm of the employee. It was very important to seventy-eight per cent of the respondents and was considered much more important than any

general or technical educational skills (1986, p. 11). Levin and Rumberger, in light of their research, concluded that the evidence provided no support for the idea that education should be directed toward proficiencies in quantitative skills, computer literacy and technology in preparation for work in either small or large firms using computer technology. Levin and Rumberger sum up their research into skills in a later paper where they conclude that:

In total some forces—such as employment shifts—appear to be raising the aggregate skill requirements of jobs, while other forces—such as the deployment of new, advanced technologies—may be helping to lower skill requirements, at least of some jobs. Thus the evidence suggests that the *levels* of skills required in the job market are unlikely to change appreciably in the near future. (Levin & Rumberger 1989, pp. 18–19)

While some sort of balance between deskilling and reskilling may prevail, skill disruption will also undoubtedly occur, as Levin and Rumberger predict. As the world economies are restructured, skill requirements will be disrupted as workers have to discard old skills and traditional career patterns and job ladders vanish (see Wallace 1989). Any such changes, however, will be modified by a range of social and ideological forces which, apart from the demands of the job, help determine whether or not work is labelled as skilled (see Vallas 1990).

Levin and Rumberger's research findings that there will be no widespread demand for high-level training in computer skills have been supported by an extensive study for the National Commission for Employment Policy conducted by Goldstein and Fraser. They conclude in their study of training for work that:

...although computer use is widespread and growing rapidly, relatively few workers need extensive education or training in computer-related skills; most learn their skills in brief on-the-job training. Young workers need not fear being frozen out of the job market because they have not learned about computers ... It may seem paradoxical that such widespread use of a technology many people associate with abstruse mathematics and electronics can be attained with relatively little special education and training. Yet this conclusion emerges clearly from the many interviews conducted. To understand this, one needs to recall that such innovations as automobiles, television, plastics, telephones, and electricity have become nearly universal while requiring relatively few highly-trained workers, mostly engineers and crafts workers in their manufacture, installation, or repair. The computer is becoming prevalent mainly *because* it has been designed, and constantly and ingeniously improved, to make it easy to use. (Goldstein & Fraser 1985, pp. 1 & 3)

Therefore, the proposition that workers should be instrumentally prepared with advanced computer skills to utilise the contemporary modes of flexible high technology is highly problematic. The problematic part which education and training should play in economic restructuring and the flexible high technology workplace is further emphasised by another report. The report, *Computers in the Workforce: Selected Issues* (National Commission for Employment Policy 1986) found that only 0.6 per cent of all workers in the USA were in jobs requiring long periods of computer use. While this area is growing, this sector will still only account for about one per cent of the jobs in the work force in 1995 (1986, p. 44). The authors of the report suggest that resources would generally be best allocated to the teaching of basic rather than advanced skills especially those dealing with high-level computer and technology skills.

Even though high-level mathematical, scientific and computer skills will not be needed by the great majority of the work force, these requirements, as part of computer literacy, are becoming part of the inflation of credentials. In a period of rapid change in the labour market, middle-class parents see 'computer skills and "literacy" ... [as] partly a strategy for the maintenance of middle class mobility patterns' (Apple 1987, p. 10). As a consequence, particularly in middle-class areas, parents fervently urge the teaching of computer technology since, in their minds, competency in this field opens the door to the more prestigious sectors of the job market. Spenner (1988) in a major review of the links between education and training, technological change and skill requirements comes to similar conclusions. Although education and training are essentially keys that allow people access to job opportunities, rather, stable skill requirements, fluctuations in productivity and phenomena such as the underutilisation of skills indicate weak relationships between training and worker performance. Spenner concludes that, first, if the relationship between technology and skills is indeed modified by training, it is over a long period of time. Second, job acquisition and performance do not clearly match a worker's training. Indeed, workers are not differentiated in the same job in productivity terms by their training. Third, there is only a very limited link between job requirements and the capacities and skills of workers. Last, Spenner argues that organisations are not managed in the rational ideal that some envisage. In this context, the rational undertaking of training by workers is 'of limited value if the labor market and organizations do not provide for its rational use' (Spenner 1988, p. 170).

Conclusion

It seems a matter of fact that in the future the use of high technology in the workplace will proceed at some pace. Moreover its use will ensure, in many instances, a greater degree of worker flexibility. But the nature, range and scope of that flexibility is a point of some conjecture, particularly as there seems to be agreement that future job growth within the Western world will be in the direction of the retail trade and service sectors of the economy (Rumberger & Levin 1985; Levin & Rumberger 1989). It is in these sectors that the majority of low-skill and low-wage occupations are to be found. In such a scenario, the calls for increased levels of skill and mathematical-science qualifications are likely merely to fuel the spiralling inflation of credentials resulting in a society where, Smith et al. argue, there are 'graduate taxi drivers and sandwich cutters with their HSC' (1988, p. 27).

The increased flexibility and adaptability of the workplace does not necessarily mean an upgrading of the skills of the worker but rather a compliance to do more tasks, intensifying the range of work at the behest of management. Indeed, the extent of worker job rotation, initiative and flexibility is more often than not set within the parameters laid out by management. Frequently, schemes which are designed to develop worker problem-solving and flexibility utilise those initiatives which save the company money and increase profits but cast aside as impractical suggestions which are likely to cost money and so reduce profitability (Rinehart 1984).

The increasing use of computing and information technology has fostered a trend to incorporate education and training into a new realism that celebrates the close ties between education and industry. The education of workers in this sense is about a resurgent instrumentalism to service what are perceived to be the requirements of the new, emergent high technology workplace. A central concern of this form of education is that workers should have the high-level skills needed to use the new technology. This has been reflected in the development, for instance, of computer literacy programs (Apple 1987; Papagiannis & Milton 1988; Noble 1984) that will be utilised in the new flexible workplaces.

However, there are a number of reservations associated with this form of technology education. First, as pointed out in an earlier part of this monograph, very few new jobs will be in the high technology area. The majority of jobs in the foreseeable future will require little if any familiarity with computers or high technology. Consequently, even people who continually utilise high technology (e.g. scanners in the modern shop) do not need to have a prior educational experience in computer literacy or technology training. Second, the degree of skill entailed in turning on computers, inserting a disk and typing on the keyboard, is not one around

which an adequate educational or training program can be structured. Such skills are better learned, where necessary, from an experienced coworker in the workplace. For as Papagiannis and Milton (1988, p. 356) point out, any computer literacy program assumes a plentiful supply of the appropriate technology in the training institution. But Useem (1984), in a study of the computer education programs in Silicon Valley schools, has highlighted this deficiency in these schools. She points out that the new economic climate which promotes the introduction of high technology into a flexible, deregulated workplace also cuts back the public sector, starving schools and other institutions for funds. As a consequence:

at a time when high-technology firms in Silicon Valley are anticipating a continued long-range demand for scientific and technical manpower, it appears that the local public schools have a reduced capacity to respond to that need. (Useem 1984, p. 218)

Education and training for any new flexible workplace should approach the inherent concepts critically. It should examine the relationships between society and the industrial sector. It should be more than the narrow training of technicians in technical tasks, either specific or more general, as required by the new, more flexible workplace. Even the call for an adaptable, flexible work force implies a docile and passive capacity to adapt to the latest technological innovations introduced by management rather than an ability to question their origin, whose interests they enhance and why alternative processes were not debated. Thus, what is needed is to provide workers with insights which stress what Apple (1987) terms social literacy rather than merely hands-on competencies—that is, any curriculum examining the modern workplace should emphasise the history, debates, struggles, power distribution and the problematic nature of technology as well as the facility to utilise it.

In place of narrow and limited programs which emphasise technical competencies, education in the workplace should take on a form which infuses the existing scientific and technological modes of education with a sense of human agency. Such education programs should make quite clear that technology is a product of human beings who operate with certain values and assumptions in mind. Any education in the workplace should present an examination of the options and choices which exist, and ask: who decides? in whose interest? who gains? who loses? who controls? These questions are crucial, for, as Hyman (1988) stresses, flexible specialisation in a deregulated market necessitates that there will be winners and losers. He bluntly argues that 'in a competitive capitalist economy not all contestants can win prizes' (Hyman 1988, p. 53). In this regard Christopherson and Storper (1989), after research into flexible specialisation in the film industry,

conclude that insecurity and exploitation have become prevalent as work force solidarity has been undermined through the new corporate ethos of flexible specialisation. Apple (1987) is also concerned that such questions should be raised as part of any technological education and training. He insists that:

the new technology does not stand alone. It is linked to transformations in real groups of people's lives, jobs, hopes and dreams. For some these groups, those lives will be enhanced. For others, the dreams will be shattered. Wise choices about the appropriate place of the new technology in education, then, are not only educational decisions. They are fundamentally choices about the kind of society we shall have, about the social and ethical responsiveness of our institutions to the majority of our future citizens. (Apple 1987, p. 15)

Seen in this way, work force education is important, not so much merely to align any education or training to the ephemeral requirements of the industrial sector, but to equip and train people with the more fundamental, expansive skills of being able to critique and reflect on the changes taking place in society and on the shop floor. Through the development of such a curriculum any workplace education program would develop the technological awareness of employees. They would become aware of the ideological, political, economic, gender and social considerations which are embedded in what is presented as 'normal' technological practice and progress. By recognising the highly problematic nature of high technology, flexible production and the flexible workplace, such education and training in critical awareness can play a vital part in resolving the future direction which our society takes.

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READINGS

FLEXIBLE PRODUCTION SYSTEMS AND REGIONAL DEVELOPMENT

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In this paper, I examine some relations between forms of production organization and the dynamics of the space economy in contemporary capitalism. I seek, in particular, to elucidate the locational meaning of certain deeply rooted changes that are currently occurring in the industrial systems of North America and western Europe. These changes consist primarily in a relative decline in the importance of Fordist mass production and an enormous expansion of manufacturing activities based on less rigid and more highly adaptable (i.e., flexible) technological and institutional structures. The same changes are associated with and embedded in a set of wider shifts in what theorists of the French Regulationist School have termed *the regime of capitalist accumulation*, (cf. Aglietta, 1976; Boyer, 1986a and Lipietz, 1986). We might say, in brief, that the old hegemonic regime of Fordist accumulation has progressively been giving way to a new regime of *flexible accumulation*. With the steady ascendancy of the latter regime, a number of new industrial spaces have also started to make their decisive historical appearance on the economic landscape, and these now call urgently for analytical attention.

As it happens, the current situation is one of considerable complexity, for the old regime is far from having disappeared entirely, and the new one by no means as yet universally regnant. Moreover, the geographical outcomes proper to each regime intersect with one another in a sometimes disorderly and confusing manner. Despite the intrinsic ambiguities and analytical difficulties raised by this state of affairs, the old industrial spaces of the Fordist regime and the new spaces of flexible accumulation, in their purest and sharpest expression, contrast starkly with one another; and these contrasts are in turn a reflection of the very different patterns of industrialization and regional growth that epitomize each regime.

In the subsequent discussion, I shall attempt to clarify and substantiate the above remarks about the changing regime of accumulation; I shall briefly delineate some of the main features of the new geography of flexible production; and I shall also identify a few guidelines for an appropriately reformulated theory of location and spatial change.

1 From Fordism to flexible accumulation

At the core of all capitalist economic activity lies the institution of commodity production with its overarching logic of accumulation. This institution is at once an endemic feature of capitalism and yet susceptible to considerable variation in the concrete shapes it assumes at different historical moments. To exemplify the point, we need only reflect on the many contrasts between such historical episodes as the early putting out system, the period of classical factory production towards the middle of the nineteenth century, the forms of heavy industrialization based on coal, steel and chemicals that dominated at the turn of the century, or the era of mass production that stretched from the early years of the present century down to the 1960s and 1970s. Such episodes constitute more or less specific regimes of accumulation, though they certainly do not exhaust the total set of possibilities that is observable in practice or imaginable in theory; they are regimes in the sense that each represents a particular combination of sociotechnical relations through which commodity outputs are secured, the economic surplus appropriated and new investments ploughed back into the sphere of production (cf. Boyer, 1986a). Relations of this sort are materialized, moreover, within dominant ensembles of industries that help to impress on each given regime much of its detailed character and dynamics.

No regime of accumulation can function over the long run without encountering diverse crises and tensions, many of which may threaten its very existence. Serious threats may spring from such necessary or contingent conditions as class conflict, overproduction, chronic economic depression, foreign competition, and so on. Invariably, however, a web of complementary social phenomena comes into being alongside the regime of accumulation as a means of stabilizing its operation through time. These phenomena consist of a multiplicity of sociopolitical relations ranging from established patterns of consumption, through private and public means of providing education, to governmental legislation on, say, union elections and norms of business activity. Because of their role in helping the regime of accumulation to adjust to internally and externally generated crisis conditions, relations of this sort are often referred to in the collective as a *mode of social regulation*. We can, then, think of specific moments in the historical geography of capitalism as being analytically representable in terms of the intertwined relations between a regime of accumulation and a corresponding mode of social regulation. Observe in passing that I have no intention here of covertly insinuating the functionalist notion to the effect that a given regime of accumulation calls a corresponding mode of social regulation into being because that is what it needs in order to survive. But we may certainly allow ourselves the converse idea that regimes of accumulation that endure over the long run do so because appropriate regulating mechanisms have been set in place. And as Lipietz (1986) has pointed out, there are in principle many different possible modes of social regulation for any given regime of accumulation.

The Fordist regime of accumulation flourished strongly over the period

stretching approximately from the 1920s to the 1970s. Over this period of time it was hegemonic as a type of industrialization, though other types (including, for example, craft production activities) continued to exist alongside it. The main physical base of the Fordist regime coincided with an ensemble of mass production sectors such as cars, capital equipment and consumer durables. These sectors, in their classical form, are distinguished by a search for massive internal economies of scale based on assembly line methods, technical divisions of labour and standardization of outputs. The Fordist elements of the system comprise, in their essentials, the deskilling of labour by means of the fragmentation of work tasks while integrating the human operator into the whole machinery of production in such a manner as to reduce to the minimum discretionary control over motions and rhythms of work. Conditions like these were in the past invariably matched by a rigid system of labour relations as manifest in a proliferation of detailed job categories with strong lines of demarcation around each job, and the explicit codification of work rules. As the regime was consolidated in historical terms, so a distinctive and corresponding mode of social regulation was also gradually put into place. In its most fully developed expression, this mode of social regulation comprised both the macroeconomic steering mechanisms of Keynesian economic policy and the socially stabilizing influence of the welfare state. Regulation was further underpinned by a social contract (mediated by the state) in which the labour unions offered concessions to management over shop floor controls and overall production strategies in exchange for guaranteed shares in productivity gains.

At the peak of its development, the regime of Fordist accumulation was geographically associated with a series of great industrial regions in North America and western Europe, as represented by the Manufacturing Belt of the United States and the zone of industrial development in Europe stretching from the Midlands of England through northern France, Belgium and Holland to the Ruhr of West Germany, with many additional outlying districts at various locations. These regions were the locational foci of propulsive industrial sectors driving forward, through intricate input-output connections, dense systems of upstream producers. The same regions also contained innumerable large urban agglomerations rising out of the industrial base and housing the masses of workers employed in the local area. In the residential districts that emerged within these agglomerations, active processes of collective consumption, community development and social reproduction – frequently propped up by planning intervention – helped to sustain the viability of the whole socioeconomic system. Also, with steady technological change of the kind described by product cycle models, selected labour processes were periodically resynthesized and deskilled, and as this occurred they were typically reembodyed in routinized branch plants and then decentralized to peripheral locations. In this way, core and peripheral regions operated in an interdependent though decidedly unequal relation.

For a time, the entire Fordist regime and its associated mass production system

functioned remarkably well. With the ending of the long postwar boom in the late 1960s and early 1970s, however, the system entered into an extended period of crisis, which, even now, has not fully run its course. By the early 1970s, the endemic outflow of capital from core regions was becoming an avalanche, leaving behind large pools of unemployed workers and fiscally crippled municipalities. Competition from Japan and the newly industrializing countries became ever more intense and dealt a serious blow to mass production sectors in core regions throughout North America and western Europe. The crisis was intensified by a rising tide of stagflation, for in a situation of declining industrial productivity and rising unemployment, the public expenditures needed to keep the Keynesian welfare state in operation simply could not be maintained without corresponding fiscal distortions. By the late 1970s, the whole regime of Fordist accumulation together with its Keynesian welfare-statist mode of social regulation was beginning to unwind in significant ways. This unwinding was manifest in the rise of Thatcherism in Britain and Reaganism in the United States, and it was accelerated by the programmes of neoconservative reform that these administrations then began to usher in. In the face of the deepening unworkability of the Fordist regime – in its archetypal form at least – governments in both North America and western Europe started actively to dismantle the Keynesian welfare-statist arrangements that had helped to regulate it but were now only becoming an additional element of the overall crisis.

In the vacuum created by these events, the outlines of an alternative regime of accumulation began to take shape, at first haltingly over the 1960s and early 1970s, and then more assertively in the late 1970s and 1980s. In particular, a number of new flexible forms of productive activity have now appeared (or reappeared) on centre stage in all the advanced capitalist societies, and while these often differ markedly from one another in terms of technologies, labour processes and outputs, they nonetheless share a variety of other basic features in common. Unlike mass production activities which are typically rather rigid in structure, the new forms of production are generally characterized by an ability to change process and product configurations with great rapidity – an ability that is frequently much enhanced by the use of computerized technologies. They are also typically situated in networks of extremely malleable external linkages and labour market relations. By the same token, they tend as far as possible to externalize production processes by buying in services and products that might otherwise be supplied internally, and this sometimes leads in turn to concomitant downsizing of individual establishments. Many sectors that display such attributes are, in addition, the sites of a vigorous revival of entrepreneurial behaviour, renewed market competition and active technological innovation.

Flexible production activities of this general sort are, to be sure, a recurrent phenomenon throughout the history of industrial capitalism (Sabel and Zeitlin, 1985). In their modern guise, however, they possess many unique and novel features, as we shall see. The incipient phases of development of modern flexible

production activities coincide with the period immediately following the second world war, but only of late years have they begun to rival mass production as the dominant core of the advanced capitalist economies. Piore and Sabel (1984) have called this turning point the 'second industrial divide', and other commentators such as Cohen and Zysman (1987), Lash and Urry (1987) and Tolliday and Zeitlin (1986) have in their different ways also pointed to the same historical rupture. The forward surge of the new flexible production sectors at the core of the new regime of accumulation has been further underpinned by major changes in the mode of social regulation. There has been a wholesale dismantling of the apparatus of Keynesian welfare-statism and deepening privatization of social life, a marked renewal of the forces of economic competition in industrial production and labour markets and (in the United States) a sharp rise in governmental allocations for the purchase of military and space equipment. These changes are still in many ways in an experimental stage and no doubt their full extent and form remain yet to be determined. They have nonetheless brought in their train numerous significant mutations in the configuration of urban and regional development over the last decade or so.

II Flexible accumulation and patterns of industrialization

The new regime of flexible accumulation is founded preeminently on three major ensembles (or collections) of industrial sectors. These may be enumerated immediately as (a) revived artisanal and design-intensive industries producing outputs largely but not exclusively for final consumption, (b) various sorts of high technology industries and their associated phalanxes of input suppliers and dependent subcontractors, and (c) service functions, and most especially business services. In what follows, I shall deal for the most part only with the first two of these three ensembles since they are most germane to the issue of new industrial spaces. Obviously, however, service functions are important in their own right and must eventually be accommodated within the overall terms of reference of the analysis. For want of familiarity with recent economic events in other areas (Japan in particular), I shall restrict my remarks to the cases of North America and western Europe.

One of the basic common traits of the flexible production ensembles that have recently made their appearance in modern capitalism is their evident propensity to disintegrate into extended social divisions of labour, thus giving rise to many specialized subsectors. This process is a reflection of the tendency for internal economies to give way before a progressive externalization of the structure of production under conditions of rising flexibility, and it leads at once to a revival of proclivities to locational convergence and reagglomeration. A sort of submerged analytical lineage of key theoretical ideas about these issues can be traced out over two centuries of economic thought. This is a lineage that begins with Smith (1776) in the eighteenth century, passes through Babbage (1835),

Marx (1867 and Böhm-Bawerk (1891) in the nineteenth century, and then reemerges in the twentieth century in the writings of Marshall (1920; 1932), Young (1928), Coase (1937), Stigler (1951) and Williamson (1975; 1985), with an offshoot in the Italian school of industrial economics as represented for example by Becattini (1987), Brusco (1983) and Fuà (1983). A scrutiny of the works of these authors provides many important insights into the problems of the division of labour (or what Böhm-Bawerk called 'roundaboutness'), the transactional structure of production, the formation of external economies and the emergence of Marshallian 'industrial districts', i.e., spatially agglomerated production complexes together with their dependent labour markets and intercalated human communities (cf. Bellandi, 1986).

I shall not attempt to deal here with all of the innumerable theoretical and analytical questions raised by the authors cited above, and in any case, the interested reader can find extensive treatments of these matters elsewhere (Scott, 1988). Instead, I shall broadly summarize a framework of reasoning whose inner intricacies can readily be filled in on a second round of reflection. The foundation stone of this framework reposes on the proposition that when changes in economic conditions bring about intensified uncertainty and instability in production and increased competitiveness in final markets, then internal economies of scale and scope within the firm begin to break down so that the entire production system is liable to display strong symptoms of horizontal and vertical disintegration. Such disintegration enormously enhances flexibility in the deployment of capital and labour for it permits producers to combine and recombine together in loose, rapidly shifting coalitions held together by external transactional linkages. In this way, external economies of scale tend to deepen and widen, and most especially where markets are also expanding so that increasingly specialized service and input suppliers are able to find profitable niches within the total production system. Additionally, new industrial subsectors come one by one into existence thereby giving rise to continual extensions of the social division of labour – a process that may be termed *dynamic vertical disintegration*. A growing production complex thus makes its historical appearance and becomes steadily more variegated in its internal structure. So long as the pool of external economies is expanding, individual producers can find within the organizational structure of the complex increasingly diverse input options at increasingly lower prices; and the complex thus continues to grow recursively by reason of its own inner momentum of falling production costs.

There is a countervailing disadvantage that accompanies these external benefits, however. As the social division of labour moves forward, interestablishment transactional structures proliferate, and this immediately encourages certain kinds of costs to rise. These costs comprise the direct expenses of transport, communication, information exchange, search, scanning and so forth, as well as indirect financial losses caused by the diminished velocity with which circulating capital moves through the whole system. The greater the spatial dispersion of producers, the more onerous these costs will be. The immediate

consequence is that selected sets of producers with particularly elevated intragroup interaction costs will tend to converge around their own geographical centre of gravity and thus to engender definite nodes of economic activity on the landscape. With the increasing installation in recent years of just-in-time delivery systems, this tendency to agglomeration has been much accentuated (cf. Cusumano, 1985). Hence, via the play of centripetal locational adjustment, external economies of scale (a non-spatial phenomenon) are eventually transmuted into and consumed in the specifically spatial form of agglomeration economies.

The counterpart of rising flexibility in the organization of production is rising flexibility in labour markets. Two main points may be quickly sketched out in this regard. First, vertical disintegration (due primarily to instabilities in production and exchange) is reinforced where employers seek to externalize their consumption of selected labour inputs and thus to head off possible internal upward drift of wages and benefits. This strategy is especially favoured among employers with a core of skilled, high-wage workers but who also have a demand for various low-skilled types of work. Employers tend frequently to farm such work out to subcontractors ensconced in secondary labour markets. By means of this device, they effectively put bounds around the possible spill-overs on remuneration levels that might otherwise occur within the firm from high-wage to low-wage employment segments. One result of this sort of structural response is sharpened dualization of local labour markets. Secondly, where flexible production arrangements are in place, they are frequently accompanied by much fluidity of local labour markets, as manifest, for example, in elevated rates of turnover, extensive part-time and temporary work, and high proportions of politically marginal workers such as immigrants, women and adolescents in the labour force, (Boyer, 1986b; Brusco, 1983). In other words, employers attempt to tune their payroll numbers as sensitively as possible to the ups and downs of production, while cultivating fractions of the labour force whose potential for political resistance to this process is likely to be low. All such labour market fluidity is enhanced as the size of the local pool of jobs and workers increases, for where this occurs, information and search costs tend to fall and a rising stock of employment alternatives helps to compensate workers for the instability of individual jobs (hence discouraging out-migration of labour). There are therefore strong agglomeration economies in local labour markets, and these intersect with and underpin the basic agglomeration economies that arise out of the organizational structure of production.

These different outcomes have an especially intense association with sectors dominated by small and medium-sized firms, though large multiestablishment corporations have also been considerably affected by the recent turn to flexibility in patterns of industrialization. Thus, strategic reductions in make-to-buy ratios and the search for fluid employment practices are apparently becoming an ever more insistent element of the modern corporate world. Even mass production sectors have not escaped these pressures (cf. Abernathy *et al.*, 1983; Cohen and

Zysman, 1987). Producers in many of these sectors have been experimenting on a major scale with such aids to flexibility as robotized equipment, workers' quality circles (and other neo-Fordist labour practices), increased subcontracting activity and just-in-time delivery systems. The managements of mass production industries have also engaged over the last several years in highly successful attacks on the work rule rigidities and entitlements secured in an earlier era by strongly unionized workers. These trends to increased flexibility have been much encouraged by intensified product differentiation and competition in high volume markets and by the importation back into older mass production regions of the regressive labour market norms and practices now being hammered out in the flexible production complexes that form the cores of the new growth centres of the world system.

III New industrial spaces

We have seen that the emergence and expansion of flexible manufacturing systems has stimulated massive though selective reagglomeration of production. Where, we may ask, has this reagglomeration occurred? How precisely has it come about? And what are its peculiar geographical forms?

A salient feature of the new flexible ensembles of productive activity identified above is that in their incipient phases of development in the 1950s and 1960s, there was little to keep them attached locationally to the old centres of Fordist mass production. They had no especial demand for the types of inputs and labour available in such centres, and they were at the outset relatively free to locate in a variety of geographical environments. Moreover, the old centres with their high levels of worker unionization and their relatively politicized working-class populations – leading to stubborn rigidities in both the workplace and the local labour market – constituted hostile milieux in several respects for the new flexible ensembles. It may be said that for a time at least, a window of locational opportunity opened widely as the new regime entered onto the scene of modern capitalism. As a consequence many, *but by no means all*, of the producers in the new ensembles began to seek out alternative kinds of locational environments uncontaminated by previous historical experience of large-scale manufacturing activity and Fordist employment relations (cf. Scott and Angel, 1987; Scott and Storper, 1987). In such environments new and experimental kinds of sociotechnical structures of production can be established with minimum local obstruction. This is doubly important where both avoidance of rigidity and the institutionalization of flexibility are primary goals.

Accordingly, over the last few decades, many new industrial spaces have sprung into existence on the landscape of capitalism. These spaces are the outcome of a twofold process involving a tendency for modern flexible production systems to avoid older centres of accumulation, combined with a dynamic of locational implosion resulting from increasing levels of externaliza-

tion. For the most part, these spaces comprise either (a) a number of enclaves within older manufacturing regions, or (b) more importantly, a series of areas that have hitherto largely coincided with the extensive geographical margins of capitalist industrialization.

The first of these categories includes many inner-city areas in large metropolitan regions with their revitalized craft industries such as clothing, furniture, jewelry, leather goods and, in the case of Los Angeles, the film industry (Storper and Christopherson, 1987). It includes, too, suburban extensions of the same metropolitan regions where high technology industrial complexes may be sometimes found. The outstanding example of the latter phenomenon is the Route 128 industrial complex in Boston's western suburbs (Dorfman, 1983). In all such enclaves, firms usually attempt actively to exclude the traditional male working class from their labour force, and they tend instead to satisfy their demands for unskilled manual labour by preferential employment of recent immigrants and women (cf. Morgan and Sayer, 1985).

In the second category are the diverse sunbelt areas and third development zones of North America and western Europe. These are areas that were formerly peripheral or semiperipheral zones bordering the old core regions of Fordist industrialization. Their economies have traditionally been based to a large degree on agriculture, trade and small-scale industry (complemented in some cases by decentralized branch plants), and urban settlement has until fairly recently been comparatively restrained. In many instances (in the US sunbelt above all) these areas possess a sociocultural environment that is relatively free from previous direct contact with big industry and large national unions, and they have thus been especially attractive to industrial sectors that could evade the locational pull of older established industrial centres. These erstwhile peripheral and semiperipheral areas now constitute many of the new industrial spaces of the regime of flexible accumulation, and numbers of them are presently growing with exceptional vigour as freshly created agglomeration economies begin to build up within them, though there are, to be sure, important differences in patterns of growth between individual cases. To illustrate some of the similarities and differences between these new industrial spaces, let us briefly consider a few empirical examples drawn from Italy, Britain, France and the United States.

In the so-called 'Third Italy', there has been a great expansion of localized production complexes based on highly flexible kinds of artisanal industry over the last two or three decades (Bagnasco, 1977). This part of Italy lies in the northeast and centre of the country with its core area focused on the administrative regions of Emilia-Romagna, Marche, Tuscany and Veneto. In the heyday of Fordist accumulation in the postwar decades, the Third Italy lay conspicuously to one side of a territorial system organized around the large mass production complexes of the north and the decentralized branch plants of the Mezzogiorno. The industrial base of the region has traditionally consisted of clusters of craft production activities distributed over a dense network of small and medium-sized towns. Today, this base constitutes one of the most dynamic segments of the

modern Italian economy. Its principal strength resides in its many specialized agglomerations of artisanal firms producing design-intensive product-differentiated outputs in short production runs, and with remarkable adaptability of organizational and labour market relations. Some representative examples of such agglomerations are Arezzo with its gold jewellery industry, Bologna with its machinery industries and high-performance car production, Carpi with its knitwear factories, Prato with its woollen textiles, Sassuolo with its ceramics and the region of Marche with its furniture and shoe-producing centres (cf. Garofoli, 1981; Mezzino, 1985; Russo, 1985; Solinas, 1982). In direct contrast to the US sunbelt, many municipalities in the Third Italy are politically to the left. In spite of this circumstance, local administrations have tended to welcome 'non-monopolistic' artisanal forms of industry, and the sort of class polarization characteristic of mass production regions is largely absent. On these foundations, industrial producers in the area have prospered remarkably well in recent years – even over the crisis period of the 1970s – and in cooperation with specialized marketing organizations they have been able to create and dominate innumerable international market niches. In many ways, the lessons to be learned from the contemporary industrialization of the Third Italy are just as important as those of Japan.

In Britain and France, agglomerated high technology industrial complexes are now thriving at such isolated centres as Cambridge, Grenoble, Montpellier, Sophia Antipolis and Toulouse. These complexes, like those of the Third Italy, tend to be made up of small interlinked establishments, though in some cases they are also functionally focused on large propulsive plants. In general, the scale (and hence internal differentiation) of these complexes is rather modest by comparison with American standards as final markets for British and French high technology products are themselves comparatively smaller. That said, two major suburban technopoles in Britain and France have been developing with great rapidity since the 1970s, the one aligned along the M4 corridor between London and Reading, and the other located in the Scientific City in the southernmost portion of the Greater Paris region (Breheny *et al.*, 1985; Decoster and Tabariés, 1986; Noë, 1982). Even though they are adjacent to major metropolitan regions, these two technopoles are interpenetrated by semirural tracts of land with much unspoiled open space, and they are in social terms far distant from earlier foci of accumulation. In this environmental setting, production and local labour market activity based on sectors such as electronics, computers, biotechnology, software development and other sorts of high technology industry, is now apparently entering an intensive phase of evolution. Of late years, French regional policy-makers have started to play a particularly active role in the development of national technopoles. Much of this role has focused on attempts to stimulate agglomeration economies in selected areas through publicly funded CRITTs (i.e., regional technology innovation and transfer centres) and generous subsidies to innovate firms (Danon, 1986; OECD, 1986).

Finally, in the sunbelt of the United States a pattern of agglomeration of high technology industry can also be observed at isolated urban sites and in suburban technopoles. The first of these two types of location may be exemplified by centres such as Albuquerque, Austin, Boulder and Colorado Springs, each representing a particular stage in the process of new high technology industrial growth. The second locational type is strikingly exemplified by Orange County and Silicon Valley, uncontentably two of the world's densest and most dynamic new high technology production complexes (cf. Saxenian, 1983; Scott, 1988). These representative cases are all subject to advanced vertical disintegration of production processes combined with extreme labour market instability, not just among secondary workers, but among many kinds of qualified technical and scientific cadres too. In research reported on elsewhere, I have shown how both Orange County and Silicon Valley have grown insistently on the basis of a deepening social division of labour giving rise to dense constellations of interdependent producers and subcontractors situated at the core of burgeoning multifaceted labour markets (Scott, 1988; Scott and Angel, 1977). In turn, these industrial complexes have become the functional and spatial hubs of a renewed process of rapid urban growth.

Analogous phenomena of flexible industrialization and reagglomeration have been reported in southern Norway, Denmark, Flanders, Bavaria and Baden Württemberg in West Germany, the Jura region of Switzerland, northeastern Spain, central Portugal and elsewhere. Some of these areas are growing on the basis of rejuvenated craft production; others have become centres of high technology industrial development. The point must be stressed once more that each of these areas represents a unique configuration of social and political life, which means that each is also caught up in a unique developmental trajectory. That said, a common underlying system of structural dynamics can be detected in virtually every case. These dynamics, as we now know, revolve for the most part around the social division of labour, the formation of external economies, the dissolution of labour market rigidities, and the reagglomeration of production. Moreover, those places that made an early start down the path of flexible industrialization have tended to forge insistently ahead on the basis of their rich and endogenously formed spatial advantages. In this fashion, the window of locational opportunity alluded to above has started in several cases to close again as firms in flexible production sectors find it increasingly difficult to dispense with the intensifying agglomeration economies now available at particular locations in the new industrial spaces of North America and western Europe. Each particular space is the site of an evolving polarized complex of production activities, local labour market phenomena and social life, in which each element (including educational institutions, residential neighbourhoods, the apparatus of local government, and so on) contributes in one way or another to the total process of local territorial reproduction. No doubt, detailed historical exegesis of the origins of any given complex are of interest, as in the case, for example, of the standard accounts of the role of Shockley, Terman and Stanford University in the early

development of Silicon Valley; however, such exegesis can never explain subsequent long-run patterns of growth, and in any event, there are likely to be as many different anecdotes about these matters as there are individual cases. What is interesting and significant in theoretical terms are the inner dynamics of each localized complex as a congeries of interconnected producers and associated local labour markets.

The new industrial spaces that have come to the fore over the last couple of decades are developing at an increasingly fast tempo. Their developmental thrust is all the more forceful given the selective widening of markets for many of their products. Thus, for example, the design-intensive outputs of the Third Italy are now being aggressively exported throughout the world, and in the United States both military and civilian demands for high technology industrial outputs continue to rise upwards. We must not overlook the circumstance, however, that such conditions are historically reversible. Markets may shrink or give way to outside competition; dramatic resynthesis and routinization of production technologies and work organization may come about; locational decentralization and dispersal may start to undermine the process of agglomeration; and formerly thriving industrial communities may fall into stagnation and decay, just as they have done at previous times over the course of capitalist economic and social development.

IV Towards a theoretical synthesis

Modern capitalist production systems have evidently been evolving over the last couple of decades away from relatively rigid Fordist industrial structures towards more flexible forms of production organization. This evolutionary tendency is enmeshed within concomitant changes in the regime of accumulation and mode of social regulation. The geographical corollary has been a partial but pronounced displacement of the locational foundations of modern capitalism.

As these events were gathering momentum over the crisis years of the 1970s, there seemed to come about a corresponding crisis of urban and regional theory. The old accounts of the forms of spatial development associated with the regime of Fordist accumulation and its cognate mode of Keynesian welfare-statist regulation were patently no longer very satisfactory as descriptions of underlying realities; and an alternative theoretical framework capable of fully assimilating the emerging new contours of capitalist society into its universe of discourse failed signally to make its appearance. Even yet, it can scarcely be claimed that a new theoretical consensus about the current situation has formed. One of the evident responses in human geography to this predicament has been a certain disillusionment with theoretical work in general and a radical return to empirical investigation, the multiplication of case studies, and an insistence on the significance of the local at the expense of the global and universal. This reaction is entirely comprehensible, and it has provided us with many new insights about

the detailed workings of contemporary capitalism at both intermediate and micro-scales of analysis. There does, nonetheless, appear to be a burning need to reopen macrotheoretical questions about the logic of capitalist society as a whole. An especially urgent task is to investigate more thoroughly the formation, characteristics and historical course of flexible accumulation and its attendant mode(s) of social regulation, for only by clarifying these issues can we also effectively explain detailed geographical outcomes currently occurring on the ground (cf. Harvey and Scott, 1988). It is my hope that the arguments deployed above may suggest some potentially fruitful avenues of reconciliation between theoretical and empirical work in human geography as the trend to flexible production organization in modern capitalism deepens and widens.

Meanwhile, we are also faced with the need to provide a meaningful account of the contemporary conjuncture in the space-economies of North America and western Europe, with their conflicting and confusing crosscurrents. These crosscurrents spring in large degree from the copresence of an aging regime of Fordist accumulation alongside an ascending regime of flexible accumulation, giving rise in turn to an intricate pattern of old and new industrial spaces imbricated in a widening international division of labour. Whatever the future evolutionary path of this system may be, it is evident that the landscape of capitalist production is today drastically different from what it was even a couple of decades ago. In this paper I have developed some outlines of a suggested framework for thinking about these changes. There remain innumerable detailed research tasks of conceptual infilling, empirical analysis, and reevaluation.

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This paper is about the recent resurgence of flexible production organization and its impact on the shape of the space-economy. I begin by situating the analysis in the context of the theory of regimes of accumulation. I argue that a transition has been occurring over the last couple of decades in structures of capitalist accumulation and that Fordism is being gradually replaced by more flexible forms of production. I discuss the effects of this transition on patterns of industrialization and regional growth. I show (a) that production systems are displaying signs of a deepening division of labour and an expansion of external economies of scale, (b) that local labour markets are becoming increasingly less rigid in structure, and (c) that rapid reagglomeration of production has been occurring as a consequence. I demonstrate that these events have brought into existence a series of new industrial spaces in both North America and western Europe. The paper ends with a reaffirmation of the importance of macrotheoretical approaches to social and geographical investigation.

2

FORDISM'S UNKNOWN SUCCESSOR: A COMMENT ON SCOTT'S THEORY OF FLEXIBLE ACCUMULATION AND THE RE-EMERGENCE OF REGIONAL ECONOMIES

J. LOVERING

J. Lovering, 'Fordism's unknown successor: A comment on Scott's theory of flexible accumulation and the re-emergence of regional economies', *International Journal of Urban and Regional Research*, vol. 14, no. 1, 1990, pp. 159-74.

I Introduction

In a recent issue of *IJURR*, A. J. Scott presented a stimulating analysis of the 'rise of new industrial spaces in North America and western Europe'. His account, bringing together a number of ideas and empirical claims which are rapidly gaining influence in urban and regional research and beyond, is a particularly helpful contribution to the debate concerning 'flexibility'. First, he summarizes the argument that the current restructuring entails a transition from a 'fordist' mode of economic organization towards a 'postfordist' mode characterized by 'flexible accumulation' (see also Jessop *et al.*, 1987; Murray, 1985; 1988; Piore and Sabel, 1984; Sabel, 1988). Secondly, he provides an original and lucid construction of the logic whereby economic restructuring might lead to spatial restructuring. His essay adds a new dimension to the argument for the 'renaissance of regional economies' around new marshallian industrial districts (see also Sabel, 1988; Cooke, 1987; 1988; Leborgne and Lipietz, 1988; Mulgan, 1989; Schoenberger, 1988).

Allen Scott integrates these ideas in a unified 'framework for thinking about

these changes' (1988: 183), and he sets out the stages in his argument with admirable brevity and clarity. This offers us a unique opportunity to examine the theoretical and empirical issues involved. I want to respond, largely in the spirit of an immanent critique, by drawing out some questions raised by his paper. I will suggest that there are a number of problems inherent in the type of theorizing involved, in the substantive theories he invokes, and in his interpretation of empirical evidence. Those problems cast serious doubt on his predictions and on the general usefulness of his 'framework'. Despite statements to the contrary, the details of his theory also place him at considerable distance from the regulation school or any other marxist account.

If these problems attach to Scott's elegant summary, they have implications for the postfordist argument more generally. They suggest that we have a lot to learn before we can justify the bold claims currently being made about the general character of postfordism, and especially about the emergent geographical organization of production (see also Sayer, 1989; Amin and Robins, 1989). We should also be much more careful about using the term 'fordism' to describe the recent past.

II Scott's analysis of flexible specialization and the logic of new industrial districts

Scott argues that 'the old hegemonic regime of fordist accumulation has progressively been giving way to a new regime of *flexible accumulation*' (1988: 171). This claim involves both theoretical and empirical propositions. By using the term 'regime of accumulation' Scott stresses his theoretical affinity to the regulation school. He is concerned to elucidate the social forms ('mode of social regulation', p. 175) and the geographical outcomes which are 'proper to each regime of accumulation' (p. 171). Any concrete analysis of capitalism must take into account the specific historical 'combination of sociotechnical relations through which commodity outputs are secured, the economic surplus appropriated, and new investments ploughed back' (p. 172).¹

Scott's empirical claims are extremely forthright. Fordism has been hegemonic since at least the second world war, but in the 1970s and 1980s it went into decline (p. 173). The meaning of this assertion becomes a little less clear when it turns out that neither hegemony nor fordism are defined. But the text suggests that hegemony may be indicated by the existence of 'propulsive industrial sectors' (p. 173), while fordism refers to a now familiar cluster of empirical facets of capitalist production. These include commodity types (mass-produced goods); forms of technology (assembly line); aspects of the labour process (systematic allocation to highly detailed job categories and routinized industrial relations); 'a

¹ Scott explicitly refers to the concepts of a 'regime of accumulation' and a 'mode of regulation' and associates his account with the French regulation school (see also Boddy, 1989). The criticisms presented here suggest that his theory only has superficial affinities with that of the regulationists.

pervasive search for internal economies' (p. 173); macroeconomic connections between productivity and consumption; and 'the Keynesian welfare-statist mode of social regulation' (p. 174). Fordism is in decline because 'flexible forms of productive activity have now appeared (or reappeared) on centre stage in all the advanced capitalist societies' (p. 174). These flexible forms are found most clearly in craft-artisanal and design-intensive activities, high-technology industry and business services. We are invited to regard these as foreshadowing the hegemony of postfordism in the new economy.

Scott then establishes a theoretical association between the restructuring from the fordist to the flexible mode of accumulation and the emergence of new geographical tendencies in the organization of production. The flexible firm, in contrast to its fordist predecessor, survives through perpetual adaptability rather than perpetual cost reduction. As a result there is 'an evident propensity to disintegrate into extended social divisions of labour' and this 'leads at once to a proclivity to locational convergence and reagglomeration' (p. 175). The argument revolves around changes in transactions costs: under a regime of flexible accumulation, internal economies necessarily decline and external economies proliferate. The costs of using the market decline relative to those of intrafirm transactions. This leads to dynamic vertical disintegration at the level of the firm and industry (p. 176).

As interestablishment transactions become more important, so the costs of 'transport, communication, information exchange, search, scanning, and so forth' become more significant. And these are sensitive to distance: 'the greater the spatial dispersion of producers, the more onerous these costs will be' (p. 176). External economies of scale (a nonspatial phenomenon) are thereby transmuted into centripetal forces 'and consumed in the specifically spatial form of agglomeration economies' (p. 177). New spatial processes in the organization of production are reinforced by corresponding changes in labour markets. Increasing flexibility in the organization of production is accompanied by a sharpening of the divide between high-wage and low-wage groups, and the increased volatility of employment conditions. Labour market fluidity is easier to achieve the larger is the 'local pool of jobs and workers' (p. 177), so the postfordist labour market generates further agglomeration economies.

The reorganization of production and labour markets is therefore bound up with the development of new spatial pressures. Modern flexible production systems avoid the older centres of accumulation, and establish new agglomerative forces where they take root. In suitable conditions, this gives rise to new 'Marshallian industrial districts' (Scott, 1988: 176; Marshall, 1961). The gradual invasion of the new regime of accumulation therefore implies the emergence of new industrial districts in selected parts of the globe, the first signs of which can be seen in the third Italy and elsewhere. The fate of individual areas depends on the various ways in which enterprises respond, possibly under the influence of state and other agencies, to the 'window of locational opportunity' opened by the intrusion of the new regime (Scott, 1988: 178).

III An assessment of Scott's theory

Scott's contribution is considerably more sophisticated than some others, which simply extrapolate ahistorically from supposed empirical examples. But the heuristic utility of his model, and the validity of his prognosis for 'new industrial spaces' become problematic on closer inspection.

1 *The drive to externalization in response to uncertainty*

Scott's argument draws, on the one hand, from the theory of the firm, and, on the other, from empirical accounts of recent developments in the spatial organization of production. However, his way of combining these accounts in practice is unsatisfactory, with the result that his theory fails to explain the empirical patterns he identifies. Conversely, those patterns do not confirm the accuracy of the theory. In effect, Scott's model elides contingent and necessary relations.²

Central to Scott's analysis is the assumption that firms are impelled by market pressures to externalize activities which were hitherto internal:

the foundation stone of this framework reposes on the proposition that when changes in economic conditions bring about intensified uncertainty and instability in production and increased competitiveness in final markets, then internal economies of scale and scope within the firm begin to break down so that the entire production system is liable to display strong symptoms of horizontal and vertical disintegration (Scott, 1988: 176).

This is a descriptive generalization based on interpreting some observations in some historical societies. It sounds like a reasonably plausible prediction, given what we know from a number of familiar recent accounts. But should we suppose it to be true more generally? On what basis does Scott claim it to be a general prediction applicable in a variety of social and economic contexts?

Scott's theory assumes that uncertainty is *necessarily* translated into declining internal economies of scale. This assumption is invalid. For example, it is quite conceivable theoretically that firms might respond to uncertainty in very different ways from those described by Scott. Indeed, as Scott admits in passing, they did so when fordism was in the ascendent (Scott, 1988: 173). Whether uncertainty translates into rising or falling internal economies therefore depends on the context of economic practices and institutions. A significant if largely forgotten contribution of Keynes's work was an emphasis on the 'social conventions' which

² On the distinction between contingent and necessary relations see Sayer (1984) and Bhaskar (1989). Briefly, necessary relations obtain 'internally' as a result of the definition of the entity in question. They can exist only within a 'closed system', as in a theoretical model. Contingent relations exist 'externally' between entities, and their precise content will depend on the interaction of many relations. The real world is an 'open system' characterized by contingency - thus, to say that the relationship between spatial patterns and forms of industrial organization in the real world is contingent is not to say that it is random or unknowable, but that it is multiply determined. Scott elides contingent and necessary relations as a result of assuming that the conditions of his abstract model pertain in the real world.

shape the way capitalists form expectations of the future and act upon them (Lawson, 1985). Scott, however, is closer to neoclassicism, borrowing what Tomlinson has called the 'positivist' conception of transactions costs, as a set of brute facts (Tomlinson, 1986). This ignores the fact that in a world which is necessarily uncertain, and in which information is always imperfect, any real firm has to *interpret* the evidence on costs, and decide on what amounts to its 'strategy' for dealing with them (Hodgson, 1988: 203). These strategies cannot be reduced to any simple ahistoric rational calculus.³ The salience of transactions costs cannot therefore be understood purely in terms of 'transport, communication, information exchange, search, scanning and so forth' (Scott, 1988: 176). Scott's model of the firm under flexible accumulation represents a *particular*, and contentious, set of assumptions about economic uncertainty and firm decision making.

2 *The ceteris paribus assumption*

In the real world the translation from economic uncertainty to firm behaviour is a social achievement, reflecting the political economy of a specific society. The form it takes will therefore be 'contingent' in the sense that it rests on a number of determinants. We are entitled to ask how Scott's approach helps us to grasp this contingency. How does it explain the surrounding technological, social or political conditions which determine the market relationships on which his theory focuses?

The answer is, it does not try to. Instead, these questions are placed out of bounds. In the language of the kind of economics to which he periodically refers, Scott's foundational assumptions rest on a restrictive version of *ceteris paribus*. It is always necessary in theoretical analysis to separate different social processes so that the chosen object can be examined in detail. But these thought experiments must be constructed in a way that makes it possible to think about the important inter-relationships. The difficulty comes in deciding which processes can be suspended without depriving the chosen process of its character. A weakness of neoclassical economics is that its individualistic methodology means it excludes from analysis those class and other social relations which are the preconditions for the atomistic choices it examines. Scott's attempt to isolate a microeconomic logic of postfordism runs the same risk of throwing the substantive baby out with the methodological bathwater.

This is evident in his discussion of the determinants of the restructuring of the regime of accumulation and the mode of social regulation. He concedes that these changes have at least in part been shaped by national governments which have dismantled the keynesian welfare state, deepened privatization, and militarized the economy (Scott, 1988: 175). But he does not incorporate these developments in his theory of the regime of accumulation, which proceeds according to its own logic. Political influences are only allowed to affect some external parameters of the market, not internal features such as firms' responses within the market.

Scott's 'firm' is an excessively formal invention, drained of too much of its

'context-related, but essential content' (Lawson, 1989: 22), a creature of his essentialist theory of the market. This strictly limits the scope for any examination of the firm as a social organization in a specific historical context. It ignores the fact that the firm is an institution of power (Marglin, 1976). In effect, it confines us to thinking of the empirical signs of flexible specialization only in terms of firms' autonomic efficiency-driven responses to market conditions. It does not allow us to interpret empirical outcomes as complex and mediated expressions of 'strategies' intended to achieve goals (for example, in terms of changing the capital-labour relation). Concepts such as 'accumulation strategies' and 'state strategies' (Jessop *et al.*, 1987: 158-59) and their spatial constitution are strictly unthinkable within Scott's paradigm. The idea of a regime of accumulation as 'a historically achieved and temporary . . . system of macroeconomic relations that allow accumulation to proceed for a period of time' (Storper, 1985: 278) disappears behind an ahistoric model of the firm. The political construction of the local economy and labour market, and other historically specific mechanisms for the 'circuiting of profits and wages' (Davis, 1987: 10) are invisible. Scott's initial emphasis on regimes of accumulation and modes of regulation (Scott, 1988: 172) turns out to be a gloss. I would argue that he attaches misplaced concreteness to the concept of the firm and the regime of accumulation. His analysis can accurately be described as economistic.

3 *The missing nation state dimension*

The concepts of regime of accumulation and mode of regulation are unintelligible other than in terms of relations within and between nation states (Aglietta, 1979; Lipietz, 1986). Scott's detailed analysis pays little attention to the nation state and other specificities of economic structuration. It could never be said of him, as it is sometimes said of the regulation school, that he overemphasizes national specificities.

The regulation school's interest in the national economy has recently given rise to some provocative empirical work on the connections between national and international political economy, notably Davis's studies of the USA and Jessop *et al.*'s analysis of thatcherism (Davis, 1987; Jessop *et al.*, 1987). This work has focused on precisely those social relations which Scott's *ceteribus paribus* analysis places in suspended animation. It shows how salient they have been in the

³ For example, if companies collectively adopted strategies in which their external transactions were used to develop synergy with other firms (rather than simply to minimize costs), this would affect the development of internal and external economies. If firms developed labour market strategies to reap collectively the benefits of investment in the skills of labour, then we should expect a different social and spatial structuring of labour markets. Interestingly, research into the current wave of strategic alliances and consortia in the USA and Europe is beginning to suggest some alternatives to Scott's 'flexible specialization'. Cooke for example, suggests they represent attempts to replace markets by collaboration in the interests of 'flexible integration' (see Cooke, 1988).

construction and transformation of fordism. For example, the implantation of fordist-style macroeconomics and labour processes in Europe cannot be understood without taking account of attempts by US companies to leap trade barriers, and the political, military and economic influence of dominant fractions of US capital and state (van der Pijl, 1984; Davis, 1987). The message of these studies is that the fordist restructuring of postwar western Europe was a historic development in which geopolitical and national-political processes and economic ones interacted. Lash and Urry have also drawn our attention to their connections with profound cultural changes (Lash and Urry, 1987). We can only assume that the same complexity applies in the current restructuring (on the international political dimension see Bush *et al.*, 1987; Kolko, 1988). Any attempt to construct a general theory of the demise of fordism which treats the national state and the international and cultural context merely as parameters would seem unpromising. In effect this is Scott's approach.

4 *Scott's theory as part of a more general account*

In defence of Scott's theory, it might be argued that it is possible to construct a less didactic and more plausible version in which his general model would be combined with specific conditions to understand specific empirical outcomes. His account would then be rewritten as an abstract analysis which forms part of a more complex and nuanced theory. However, Scott's theoretical framework severely inhibits any such elaboration. For if the logic of the firm under uncertainty is really the foundational datum Scott wishes it to be, then we can only pose questions about 'contextual' social and political relations in the form of specifying the 'initial assumptions' of a *ceteris paribus* model.

If we try to grasp the idea of changes in context by changing those initial assumptions, we move away from the *ceteris paribus* world Scott needs to establish his key results. The relation between flexibility and internal economies ceases to be foundational. This is not a promising framework for an analysis of the dynamic and mutually constitutive relationship between market forces and institutional parameters. Scott's theory cannot be extended to deal with context and contextual change without becoming theoretically incoherent. It is hard to see how it can be more than a simple, directly applicable *a priori* model. And as such, it is empirically unsuccessful.

IV The interpretation of empirical evidence

The empirical examples cited by Scott (and most other writers in this field) include the so-called 'third Italy', Silicon Valley, Route 128 and Los Angeles. Grenoble and Montpellier in France and the M4 corridor and Cambridge in the UK are cited as further, if less impressive, evidence in favour of the emergence of new industrial spaces (Scott, 1988: 180).

Reviewing these cases, Scott claims that:

what is interesting and significant in theoretical terms are the inner dynamics of each localized complex as a congeries of interconnected producers and associated local labour markets (Scott, 1988: 182).

For Scott these agglomerations express (only) the transcendent logic of flexible accumulation (see also Scott and Cooke, 1988: 243).⁴ But Scott's own initial emphasis on sociotechnical relations of production and reinvestment suggests a range of other possible explanations.

For example, the industrial patterns of Route 128 or Los Angeles might instead be interpreted as expressing the spatial logic of US military-industrial capitalism (see Markusen's study of the US military economy – Markusen, forthcoming). I do not wish to assert one favoured interpretation over another, but would merely suggest that many 'inner dynamics' are expressed in these, as in most, observable patterns (see also Sayer, 1989; Amin and Robins, 1989; Amin, 1989).

A closer look at the example of the UK reveals a much more complicated picture than implied by Scott (and some other commentators). Many aspects of his postfordist stereotype simply do not fit the evidence. I shall argue that the UK example demonstrates the theoretical point made earlier: the debate on fordism/post fordism must be framed in terms which allow it to engage with 'exceptions'.

Despite the enthusiastic advocacy of flexible accumulation by some writers (e.g., Atkinson and Gregory, 1986), no evidence has yet appeared to suggest that it has established a 'systemic' or hegemonic presence in the UK. Jon Morris has shown that the adoption of the technologies associated with flexible specialization in the UK has often been motivated by cost saving, rather than some attempt to develop innovation leadership. Morris also found that many companies actively chose *not* to adopt flexible specialization (Morris, 1987: 2).

Williams *et al.* found that the processes underlying the adoption of flexible specialization, where it could be found, were often quite different from those in Scott's ideal type. New products, and processes, tend to come from existing firms, not new ones (Williams *et al.*, 1987: 425). Production technologies such as flexible manufacturing systems (FMS) are mainly being adopted by the large firms, and even there they tend to be used to boost established batch production techniques (Williams *et al.*, 1987: 431).

There is little evidence that radically new 'flexible' product strategies or labour processes are sweeping the UK industrial landscape clean (Pollert, 1987). Several studies have shown the current restructuring in the labour process to be complex and equivocal (Elger, 1987; Smith, 1989). The GLC's study of London industries found little evidence of any widespread move to flexible specialization (GLC 1985). The locality studies under the changing urban and regional system initiative and the social change and economic life initiatives reveal as many

⁴ Sabel is more cautious: 'there is no plausible list of the necessary and sufficient conditions – rare or otherwise – for the emergence of flexible economies' (Sabel, 1987: 45).

continuities as innovations in firm strategies and the labour process (Lovering and Meegan forthcoming).

Weakest of all is the evidence for the emergence of new marshallian industrial districts in the UK. The areas within the UK which have been cited by enthusiasts as 'new industrial spaces' are the M4 corridor and Cambridge (e.g., Scott, 1988; Sabel, 1987; Mulgan, 1989). But if there is any research which demonstrates that these zones fit the description of a genuine industrial district ('spatially agglomerated production complexes together with their dependent labour markets and intercalated human communities: Scott, 1988: 176), it has yet to be published (see for example, Morgan and Sayer, 1989). Oakey and Cooper found that small high-technology companies in the southeast and Scotland were not particularly oriented to local customers, and sourced markedly few of their inputs locally than those in the San Francisco Bay area (Oakey and Cooper, 1989: 351). UK high-technology industry is certainly highly concentrated (although biotechnology is less so), but this reflects the impetus of existing regional specializations, not a new spatial pattern attributable to flexible specialization.

And the growth of activity and employment in the M4 corridor and Cambridge is only partly due to these agglomerations. If it must be attributed to any one sector of industry, this must be the producer and consumer services sectors rather than 'high-technology' (Mason *et al.*, 1989; Thrift *et al.*, 1987; Bassett *et al.*, 1989; Hall *et al.*, 1987). These are not sectors that fit Scott's stereotype of postfordist flexible accumulation. In fact, in terms of markets and labour processes, much of the expansion looks remarkably like the fordism we have been told is disappearing: most units produce standardized products or services, and most employees work in large units with a routinized labour process, standardized internal labour markets and collective pay arrangements. The sectors which are most closely associated with flexible accumulation, especially advanced high-technology sectors are still very small in terms of aggregate employment, and there are reasons for anxiety about their future prospects (Blackburn and Sharpe, 1989). There is little evidence that they are playing the hegemonic role described in the postfordist literature.

Evidence of some localized subcontracting does not justify the claim that high-technology industry, even in the most densely concentrated zone in the 'western arc' around London, constitutes a marshallian industrial district. Moreover, a major part of UK high-technology industry falls into the defence sector, which is dominated by a small set of large and relatively immobile companies. Studies suggest that dynamic local interdependencies in this sector are rare, and hardly affected by the current restructuring (Breheny, 1988; Bristol City Council, 1988). The external economies of proximity often consist of little more than the chance to poach scarce labour from other employers (NEDC, 1988, Oakey and Cooper, 1989: 353).

On the whole it appears that the advanced high-technology industries in the UK are made up of a series of local enclaves with only modest 'agglomerative' linkages, and often few local linkages at all (Morgan and Sayer, 1989). This seems

true even of the supposedly paradigmatic new industrial space – the ‘Cambridge phenomenon’ (Saxenian, 1987). There are signs of localized growth in business services in some major regional cities (Thrift *et al.*, 1987), but this hardly amounts to the emergence of new industrial districts. If new spatial economies are emerging in the UK, they are so modest as to be dwarfed by longer-established patterns (Williams *et al.*, 1987). The City of London is a case in point. The capital’s finance and business services sector is probably the nearest the UK has to an ‘industrial district’. But what is remarkable is its vintage – it is hard to see how this could be described as postfordist in any useful sense. In short Scott’s empirical account drastically oversimplifies the UK case.

The UK example might still confirm Scott’s more general theoretical point if it could be shown to reflect nationally specific factors delaying the arrival of postfordism. But I have argued that Scott’s theory does not readily open out onto a wider theory of the conditions of possibility of postfordism. His model is to be applied directly to the analysis of specific situations, but the UK case shows that this does not work. Sayer (1989) and Amin (1989) suggest that the same could be said of other national examples cited by Scott. His allegedly general process does not appear to be empirically general at all.

I have suggested that in the UK the fordist national circuiting of the economy has been subverted, but that many other fordist patterns remain, for example in the labour process. The restructuring cannot be grasped adequately as flexible specialization. If we were to explain why postfordism is taking this form in the UK our attention would be drawn perhaps to the impact of the Thatcher government on the recession, the particularities of UK capital or the modest size of the UK (Lovering, 1989b). The rather weak versions of ‘flexibility’ which generally seem to be present are consistent with the evidence for a distinctively ‘passive’ accumulation strategy on the part of UK capital and government (Fine and Harris, 1985; Leys, 1983). The scale factor may also be important: with generally good communications, and growing European links, the UK may be too small to require subcontractors to move into new industrial agglomerations. Moreover, the existence of several million effectively unemployed people may have reduced, rather than intensified the pressure on firms to adopt new flexible strategies (MacInnes, 1987). These questions may be just the ones we should be asking if we want to understand the emergence of a new regime of accumulation. They are bypassed in Scott’s approach.

V Conclusion

1 *What was fordism, and what follows it?*

The comments are not meant to deny the value of the concept of fordism, or to dismiss altogether the idea that fordism is coming to an end. On the contrary, the broad spirit of inquiry implied in the postfordist debate is most welcome. But

we need a less deterministic and economistic approach which can allow that the historical epoch of fordism was more complex and multidimensional than Scott's analysis suggests, and that some fordist features may survive into the new context of postfordism. The value of theories of fordism and postfordism is that they have made us begin to think again about the historically specific ways in which economic and 'noneconomic' social processes articulate together (Bonfeld, 1987; Jessop, 1988). The regulation school represents one version of this project, but many of its insights can also be found in the 'social structure of accumulation' writers (Gordon *et al.*, 1987), the 'restructuring school' (Massey, 1984; Lovering, 1989a), or the notion of 'capitalist organization and disorganization' (Lash and Urry, 1987). These approaches all share the idea that radical change should be understood in terms of the breakdown of the coherence of the prevailing 'cluster' of economic, social, political (and spatial) patterns through which capitalist production and distribution are circuited, and attempts to construct a new nexus. Each leads us to examine the mediation of historically specific institutions in reproducing the systemic properties of capitalist production.

We may decide for convenience to follow Gramsci (Gramsci, 1971) and label the cluster which has endured for some decades and which is now undergoing fundamental change as 'fordism'.⁵ But even if we agree that this fordism is coming to an end, we must suspend judgement on the shape of the 'cluster' which will follow it. Flexible specialization may be but one of several coexisting forms in which capital accumulation can take place, as the UK example suggests. The current restructuring is better understood as a series of corporate, national and international experiments actively undertaken by specific capitals and state organizations (for an excellent account of the US case see Harrison and Bluestone, 1988; for the UK, see Jessop *et al.*, 1987; for a global overview, see Kolko, 1988). These experiments are inevitably incomplete, and the restructuring is contradictory, creating new potentials for a shift in the relation between capital and labour, and new sources of destabilization. The economics, politics, and culture of postfordism are therefore contested terrains (Murray, 1988: 12; Harrington, 1989). Consequently flexible specialization should be viewed as a contingent local outcome, not an inexorable process of contemporary capitalist development. To this extent, it does not represent a new regime of accumulation

⁵ But our understanding of this 'enduring cluster' of economic and social institutions is still very limited. For example, in the UK there must be doubts over the degree to which 'fordist' patterns were ever hegemonic in the labour process (Cronin, 1979; Sayer, 1989) and in the regime of accumulation as a whole (Fine and Harris, 1985; Amin and Robins, 1989). The establishment of a macroeconomic relation between productivity and working class incomes (the central economic feature of fordism) reflected a complex of ideological and national processes at the level of the nation state rather than 'general' or autonomous processes within the class relation between capital and labour (Leys, 1983). (Lash and Urry make the same point in relation to their somewhat broader concept of 'organized capitalism' Lash and Urry, 1987). The authors of a highly relevant study of the UK case recently concluded that, 'it is far from clear that a distinctive Fordist or post-Fordist pattern of society exists ... the notions of Fordism and post-Fordism become misleading if not carefully specified' (Jessop *et al.*, 1987: 131).

in the hegemonic sense of regulation theory. The concept of 'flexible accumulation' is not a theoretical master key which can unlock all the secrets of the new economic order. If it appears to be empirically important in particular places this needs to be explained accordingly.

If this is true then future geographical outcomes are much more open, less determined, than is implied in the current enthusiasm for new industrial districts (Amin, 1989; Amin and Robins, 1989). The debate has rightly drawn attention to some extremely interesting outcomes which *may* prefigure wider development. And Scott's analysis is particularly helpful in bringing to the fore some of the theoretical issues and empirical premises of the debate. But in so doing it reveals how much more needs to be done.

2. *Research tasks*

The concept of postfordism has been enormously influential in the late-1980s (Rustin, 1989). In recent years the popularity of the narrower idea of flexible specialization has given rise to something of a backlash. There is a danger that this will obscure the important contributions of the postfordist debate. Some critics suggest that Scott's mistake lies in the attempt to interpret developments in terms of changing regimes of accumulation (see e.g., Boddy, 1989). This implies either that we already have the theory we need, or that we can explore empirical data without theory. Scott is surely right to confront what he sees, with some justification, as a revival of the myth that facts speak for themselves. My criticism is not that Scott attempts a postfordist analysis, but that the theoretical terms he uses prevent him completing it adequately.⁶ As a result his guidelines for future research are questionable.

Scott concludes with a disparaging glance at 'the multiplication of case studies' in social research. For him this trend indicates a disillusionment with theoretical work in general. It focuses on details in a way that fails to address important questions about the dynamics of capitalist development. Scott suggests that empirical study can be rescued if it is guided by the urgent need 'to investigate more thoroughly the formation, characteristics and historical course of flexible accumulation and its attendant mode(s) of social regulation' (Scott, 1988: 183). His theoretical framework opens new avenues of reconciliation between theoretical and empirical effort.

The implications of the criticisms in this paper are twofold: first, although we certainly need to ask macrotheoretical questions about capitalist development, this is not necessarily best done by focusing on the rise of flexible accumulation. Indeed, we might do better to organize research around the more open idea of the unresolved crisis of fordism. Theoretical and empirical work should be

⁶ This is not to suggest that other writers have succeeded in transforming the regulation school's general insights into a nonreductionist theory. Some of the problems are explored in Bonfeld, 1987; Jessop, 1988; Peet, 1989.

integrated to generate a specification of fordism which avoids Scott's economism (for a similar argument, see Jessop *et al.*, 1987; for an idiosyncratic example, see Lash and Urry, 1987). We should certainly give much more attention to the full variety of industrial, social and cultural organization, the geopolitical dimensions of the fordist era and the survival or expansion of many strands across the world. Above all, we need to explore the concrete processes through which its successor will be shaped. This requires theories of 'the construction of markets' rather than theories which take market parameters for granted. Research into the interaction of international relations, nation state policies, and management strategies, could provide new insights here, while also offering something to the formation of policy and strategy.

Secondly, in devising specific research strategies within this project, there is no reason to suppose that the route of empirical case studies is inferior to the 'theoretical' one proposed by Scott. Empirical work is much more than a matter of directly testing hypotheses as in the neoclassical approach to which Scott ultimately adheres. It is the starting point for the abstractions which any theory requires (Sayer, 1984; Bhaskar, 1989; Collier, 1989; Massey, 1984; Savage *et al.*, 1987).

The postfordist debate has not yet generated the new scientific paradigm which can give birth to a new spate of kuhnian 'normal science'. Even if we accept the importance of analysing changing regimes of accumulation and modes of regulation, we are nowhere near the stage where we can settle down with Scott, to 'conceptual infilling, empirical analysis and re-evaluation' (Scott, 1988: 183).

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3

TOWARDS FLEXIBLE SKILL FORMATION AND TECHNOLOGICAL LITERACY: CHALLENGES FACING THE EDUCATION SYSTEM

J. MATHEWS, G. HALL & H. SMITH

J. Mathews, G. Hall & H. Smith, 'Towards flexible skill formation and technological literacy: Challenges facing the education system', *Economic and Industrial Democracy*, vol. 9, no. 4, 1988, pp. 497-522.

This paper looks at the changes occurring in Australia's economy and industry, and the challenges these pose for the education system. The paper outlines a response to these challenges that focuses on flexible skill formation and the development of technological literacy, which are taken to constitute the preconditions required of any citizen to be active in the democratic system. The paper draws on the literature that characterizes the current upheavals in industry as the transition from one technological paradigm to another — from a paradigm based on mass production, mass consumption and fragmentation of skills, termed Fordism, to a paradigm based on flexible production patterns, geared to quality rather than quantity, and based on skill enhancement as the foundation of productive work. In sketching an educational response to this change in the techno-economic paradigm, the paper focuses on five issues: coherent career paths, links with industry; linkage; cross-accreditation and work-study arrangements; breaking down curriculum barriers; and flexible learning strategies.

Introduction

The education system, like other major human-services organizations, is having to respond to unprecedented levels of change in industry and the economy. Shifts in technology, in work organization and in patterns of skill formation, all provide a rapidly changing context for education.

There is now widespread agreement that Australia is an under-skilled and vulnerable society. For most of the post-war period Australia has been content to base its standard of living on the export

of raw materials and primary commodities; it imported advanced technologies and 'know-how' as these were needed. For decades, manufacturing industry was allowed to stagnate, and any skill shortages felt were remedied by immigration of skilled workers and their families from Europe. As a result, Australia faced the economic challenges of the 1980s with its primary industries confronting falling prices and fiercer international competition; with an underdeveloped and over-protected manufacturing base; with a poor capacity to adopt technological innovations and an almost complete absence of social mechanisms and structures for coping with change; and with rigid structures of skill formation adapted to a previous industrial situation (Ford, 1984).

Report after report has noted how the Australian education system is divorced from industry training and skill needs; and is caught between demands for providing more vocationally oriented courses, on the one hand, and on the other, for providing a basic democratic and civic foundation for all students (ASTEC, 1980; EPAC, 1987). These are seen as incompatible and competing goals, as if education were a zero-sum game.

The former demand can be characterized as a form of 'economic instrumentalism', seeking to subordinate the output and structure of the education system to today's vocational requirements, but ignoring the demands of tomorrow. The latter demand can be characterized as a concern to develop a democratic curriculum divorced from its economic and industrial context and predicated on a non-problematic assumption of endless economic growth.

We advance a third perspective that sees the role of the education system being to produce well-rounded, technologically literate citizens who have some insight into the processes of scientific and technological development, and the capacity and will to keep returning to the system to sharpen and broaden their skills and understanding. Such an approach is the prerequisite for both a continued and enhanced state of industrial competitiveness, underpinning basic social wealth generation and our standard of living, and for the participation and democratic involvement by citizens in an increasingly complex world. This perspective focuses on what we call flexible skill formation and technological literacy. Nothing short of this is adequate to cope with the coming firestorm of technological change, skills upheavals and radical social and economic transformation.

Our concerns are with broad responses and not with any notion of vocational dominance or technologically determined streaming. Skills formation cannot substitute for cultural or democratic social formation. We agree with Jean Blackburn who argues that:

It is important now to say that schooling which does not attempt seriously to give all students access to their collective past as Australians and human beings, to reflections on the human condition, to the arts and the great human achievements of science and mathematics, is not what we are about when we speak of a better educated population (Blackburn, 1986:13).

Such goals will not be achieved unless they take into account the economic and industrial context to which future and present citizens must adapt. This is the precondition for democratic participation on the part of the majority of citizens in shaping Australian society in the future.

The Economic and Industrial Context

Although a range of factors have undoubtedly contributed towards Australia's current economic difficulties, one of the more fundamental has been the shift in the pattern of international trade away from raw materials, with a consequent decline in demand for Australia's major exports. The underlying trend in this direction, apparent throughout the post-war period, has in more recent years been reinforced by shorter-term cyclical influence. Against this, imports have continued to mount, due to the dependence of the domestic market upon a widening range of imported goods and services.

The inevitable outcome of Australia's failure to adapt to the changes in international trade, and more particularly to move into the faster-growing product areas, has been the emergence of a serious trade imbalance, accompanied by a declining exchange rate and growing foreign indebtedness. The rapid economic growth of recent years has masked an underlying deterioration in Australia's relative macroeconomic performance and a marked decline in living standards.

Since these trends in international trade are unlikely to be reversed in the foreseeable future, the task which lies ahead is clear: Australia's export base must be broadened, with particular emphasis being placed on the expansion of high value-added exports. Increasingly,

these are seen to be the more knowledge and skill-intensive goods and services.

Manufacturing Industry in Australia

Australia is not yet an advanced industrial country. Around 80 percent of Australia's export trade in goods is accounted for by primary products, and less than 20 percent by manufactures. This is in stark contrast with the overall pattern of world trade; world-wide, exports of manufactures account for close to two-thirds of total world exports. At the same time, exports of services have increased steadily, but Australia remains substantially as a net importer. With the improvement in cost competitiveness due to the exchange rate depreciations occurring since 1985, the conditions have been created for an improvement in Australia's trading position. Nevertheless, this will have to be accompanied by a substantial lift in the performance of industry in such areas as product design, quality, marketing and after-sales service if this potential is to be realized. A shift in the orientation of the Australian economy from the production of agricultural and mining products and basic manufactures, towards higher value-added goods and services is also needed (Crisp, 1980).

Microadjustment: The Need for Greater Specialization

Although Australia's trade performance has not been particularly favourable in the higher value-added product areas, there have been some notable successes by individual firms. In such diverse areas as medical and scientific instruments, engineering, financial and technical services, high-fashion garments, sporting goods, jewellery and craft goods, Australian firms have clearly demonstrated an ability to compete in the international marketplace. These are the firms which have been able to respond to market niches, invariably through the effective utilization of highly specialized knowledge and skills. It is widely agreed that a more broadly based shift within industry towards the more specialized product areas will require greater effort in research and development, product design and development, production and quality control, as well as marketing and after-sales service. This will require in turn the development of technical expertise and skills of a high order and, above all, a degree

of imagination, creativity and flair, a willingness to take risks, and a capacity for cooperative effort which has not in the past been widely evident in Australian industry.

Apart from the influences mentioned above, technological change is clearly having a major impact upon the structure of Australian industry. The greater flexibility of processes, made possible by developments in microelectronics in particular, has great significance for Australian industry. It can improve the flexibility of individual firms, enabling them to manufacture a wide range of items and to respond quickly to new market demands. It can also raise the cost-effectiveness of the short production runs which are typical of Australian industry.

Improvements in the relative efficiency of small-scale manufacturing process which have been made possible by recent technological advances, have been accompanied by an increased recognition of the fact that smaller-scale operations can have significant advantages over large ones. Close relations between management and workers are generally easier to maintain, with less rigid management and decision-making structures. Smaller units also enjoy lower overheads. These advantages are likely to be particularly important in the more specialized areas of production, such as computer software and a range of products and processes incorporating programmable microchips.

The likely course of events was spelt out clearly at the Second World Conference on Productivity and the Future of Work, held in Munich in October 1986. In the keynote address, Björn Svedberg, President and Chief Executive of LM Ericssons, Sweden, stated that skills enhancement was central to manufacturing improvement, and that therefore subsequent and further education would be 'the main educational issue of the 1990s' (Svedberg, 1986). This theme was echoed throughout the conference, which revealed a clear consensus on the shape of the future industrial order, as being based on quality rather than on quantity, and on skill enhancement rather than on fragmentation and division of labour — a consensus subscribed to by Scandinavia, West Germany and Japan, which are now the world leaders in the most advanced areas of manufacturing technology.

The burgeoning literature on the paradigm shift that is occurring in industry emphasizes the absolutely critical role that education and training play in industrial innovation, adaptability and, ultimately, survival. Skill formation will be the central issue of concern in the

more flexible, less authoritarian, more participative and democratic workplace of tomorrow.

A New Technological Paradigm

The changing economic and industrial context thus requires a new emphasis on flexible skill formation and technological literacy. These terms draw from a current of thought that sees the present decade as one of transition between two major technological paradigms. The industrial system that has dominated the twentieth century — a system based on mass production, mass consumption, Taylorized fragmentation of work and deskilling — is visibly dying, and creating economic chaos as it is forced from the historical stage. A new industrial system is being born — based on the technologies of microelectronics and new materials, intelligent production, human-centred work organization, worker responsibility and multi-skilling. The countries and governments that actively favour this new paradigm are going to be the survivors into the twenty-first century; those that cling to the Fordist paradigm that powered the 'post-war boom', but which is now exhausted, will in our view find themselves marginalized and driven to the periphery of the global industrial system.

There is now a flourishing literature supporting this point of view, arguing that a radically innovative range of institutional and government responses is needed to cope with the new wave of technological proliferation based on microelectronics and new materials (Perez, 1983, 1985; Piore and Sabel, 1984; Roobeek, 1987; Mahon, 1987).

This view supports current steps to reinforce the role of education and training and the links between them, as well as steps to assist the development of innovative, technology-based firms, e.g. through incubators (Allen and Levine, 1986). In a word, it favours an industrial system that is varied, diverse and dispersed (and hence more democratic and multi-skilled) as opposed to the Taylorist/assembly line paradigm characteristics of massification, homogenization and agglomeration.

Flexible Skill Formation

Emerging Skill Requirements

The developments within industry described above will bring about major changes not only in occupational structures, but also in the kinds of skills required by industry. There is likely to be an increasing emphasis upon cognitive skills rather than the traditional manual skills of the craftsman and the operative. It will be increasingly important for workers at all levels to possess the personal and social skills they will need to work effectively with others as part of a team. The workplace is likely to become more democratic, and training requirements will have to reflect this.

If young people are to be able to cope with the demands of the workplace, and if they are to make a positive contribution to the development process, they will need a broad base of knowledge and the requisite intellectual skills to do so. Emphasis will need to be placed, in the primary and secondary years of schooling, on the development of resourcefulness, cooperativeness, independence and problem-solving abilities, as well as on literacy, numeracy and basic technical skills.

Against the broad developments in curriculum which are occurring, it will be important to encourage greater student participation in mathematics, science and technology studies. In the future, school-leavers will need to have attained a reasonable level of competence in these subject areas in order to progress to higher levels of education and training, and to move into the more intellectually demanding areas of employment.

In taking this approach, we are employing the concept of 'skill' in a broad sense, overlapping with related notions of 'attitudes' and 'knowledge'. In this we draw from the literature on the skills requirements of new, computer-based technologies, where the emphasis is on abstract and problem-oriented skills, rather than on specified sequences of operations which can be taught once and for all. Experience to date indicates that firms which *under-estimate* the skills component or dimension of new technology, are the ones that benefit least and can even be bankrupted by such oversights (Senker and Beesley, 1986).

Further Training and Re-training

Apart from meeting the needs of young people entering the labour force, serious thought must now be given to the education and training needs of those who are already in the workforce, i.e. older workers. It will require greater efforts to meet the educational and training needs of these workers — not only in terms of the content of courses, but also in terms of approaches to learning. These will need to include adequate provision of bridging programmes for older workers and the development of properly structured self-paced learning courses which can take account of their diverse educational attainments, knowledge and skills.

A substantial component of an overall programme addressing such needs should be provided within industry, for the following reasons:

1. industry is best placed to provide instruction in some of the more specialized and advanced skills;
2. industry has in many cases more advanced equipment than is available in universities or colleges;
3. the needs of some individuals can most effectively be met through industry-based courses (e.g. older workers, many of whom would feel alienated in a college classroom);
4. some forms of practical training simply cannot be adequately simulated in a classroom or skill centre, but must be provided on-the-job.

Hence, we support a 'flexible learning' strategy to meet these needs. In order to ensure that the quality of industry-based programmes is maintained, and that workers gain recognized qualifications or credits for the successful completion of industry-based programmes, it is clearly important that the recognized educational institutions play a leading role in these developments.

Changes in Industrial Relations

Improvements in flexibility and renewed emphasis on skills formation are likely to come to nought unless there are changes in the nature of agreements between unions and employers over the organization of work and the relations between operatives and management. There are now signs that the industrial relations system in Australia is indeed changing in response to these new requirements.

The Australian Council of Trade Unions (ACTU) has put forward its agenda in the comprehensive report *Australia Reconstructed* (ACTU/TDC, 1987). Employers are concluding agreements with unions over these issues through 'Restructuring and Efficiency' agreements negotiated under the second tier of a new, post-indexation, wages setting system. The first major agreement of this kind was registered by the Australian Conciliation and Arbitration Commission in August 1987, between Ford Australia and the motor industry unions which are party to the Vehicle Industry Award (AC & AC, 1987b). This agreement stems from a framework industry-wide agreement reached earlier in the year, setting an objective of changing management and employee work practices which impede productivity; protecting employment; and expanding the skills base of employees. Under the Ford agreement, skills formation is given special emphasis.

The Company is committed to the objective that no employee will fail in job performance or in the full realization of career potential for lack of adequate company training.

The Company acknowledges the additional need for training arising out of the broadened job responsibilities and associated with the second tier restructuring and efficiency agreement. This training need is particularly recognized where the broadened duties of particular employees could involve an occupational health and safety hazard if performed by an untrained operator.

Accordingly, the Company will develop in consultation with relevant Union representatives, a detailed training program with respect to changes in work organization associated with the restructuring and efficiency agreement. The training program will include details regarding:

- the level and amount of training required;
- who will conduct the training;
- method of training to be used;
- the time when training will be carried out.

The costs associated with the restructuring and efficiency training program will be met by the Company and all training will be conducted in Company time.

In relation to training generally, the agreement notes that: 'The parties agree that a workforce whose skills are being constantly upgraded is vital to the Company's survival and future success (AC & AC, 1987b).

This is a far-reaching agreement that sets Ford Australia on a new course, and sets a standard for other firms and industries to follow. This is not, however, an isolated agreement. In other sectors great

progress has been made in broad-banding of skills (e.g. in the printing industry in the 1970s); in development of adult apprenticeships (again in the printing industry in the 1980s); and in the development of coherent career paths for workers.

Within the metals manufacturing industry a bold initiative was recently announced, to overhaul the Metal Industry Award, and replace 300-odd narrowly defined occupations with seven broad-banded skill categories. More importantly, the initiative aims at providing for movement from grade to grade as new skills are acquired in the course of a worker's career (Harrison, 1988; AC & AC, 1987a). A number of training options are currently available to allow workers to move from grade to grade. The task is to maximize the articulation of these options to provide clear vertical paths of career development through the award categories — particularly from apprenticeship through associate diploma to degree level — and to establish links between workplace-based training and formal courses in education institutions.

Skill Formation and the Role of Industry-based Training

Locked as it has been into its Fordist technological paradigm, Australian industry has traditionally paid little attention to structured on-the-job skill formation. Rather, the call has come from industry for schools and colleges to provide 'vocational training' which is normally given a very narrow interpretation. Such an approach sacrifices the capacity of the education system to provide broad-based technological literacy and, in effect, passes on the costs of training from the private to the public sector.

The leading industrial countries of Scandinavia, West Germany and Japan pursue a very different practice. There the cost of on-the-job training is seen as a cost of production, along with raw materials and capital. Indeed, the cost of training is a more significant item than either of these two traditional factors.

In Sweden, for example, the government used the technique of the Renewal Funds to ensure that \$1.5 billion was spent by industry in 1986/7 on training, and research and development, in a bid to keep Swedish industry at the forefront in manufacturing. These funds operated through the mechanism of a 10 percent profits levy, imposed in 1985, with the funds being held by the Swedish Royal Bank, and returned to their firms of origin for training or research

and development programmes that were jointly agreed by the social partners, namely employers and unions (ACTU/TDC, 1987; Meidner, 1987).

We thus see a trend in Australia towards more 'vocational training', which we would call targeted skill formation, to take place in industry settings. Hence our concern that the education system play a flexible role in helping to deliver this training, and in ensuring that industry training operates, where appropriate, through accredited courses and with workers acquiring portable skills. This involves a shift away from reliance on external labour markets to internal labour markets (Curtain et al., 1987).

Technological Literacy

The trend towards targeted skill formation will clarify the role of the public education system as being to provide a flexible and broad, cultural and technological literacy. This will equip school-leavers for the processes of change that they are likely to experience in their lifetime.

Such a view implies that the educational system should not be expected to produce a batch of fully trained individuals in a vocational sense, but instead it should aim to produce individuals who are well-rounded, with broad skills and generalized competence in mathematics, language, and the methods of science, in logical processes and problem-solving techniques, as well as in a knowledge of language, literature and cultures. A concept of 'technological literacy' should broaden the liberal notion of the arts and sciences as being the passport to economic and democratic participation in the wider society.

By technological literacy we refer to a capacity on the part of citizens to comprehend the essentials of technological design and the motives for change. Such a literacy is a means of empowering them to play a meaningful role in the extensive processes of restructuring and reconstruction that lie ahead. Such a notion is radically opposed to the view, deeply rooted in our education system, that knowledge of science and technology is needed only by an elite, while others should rest content with a technology-free notion of 'humanities', and the bulk of the population should survive on a few narrowly imparted vocational skills (Allen, 1987). This conventional approach in practice disenfranchises people from any form of participation in the

key issues which affect their livelihood and, ultimately, their social involvement.

Role of the Education System

Far from making the public education system redundant, we see the new technological paradigm as placing a higher premium than ever before on a healthy and democratic public system. But it must not be a rigid, inflexible system divided into separate sectors and accreditation streams that scarcely communicate with each other. The system must become more *flexible, adaptable, integrated* and *accountable* if it is to survive and play the public role for which it has the potential.

The major issues to be addressed are the following:

1. the design of coherent career paths based on skills formation and development within broad industries;
2. the forging of constructive links with industry;
3. the development of imaginative linkages, cross-accreditation and work-study arrangements;
4. the breaking down of rigidities within the education system, and opening up of career paths for teachers;
5. breaking down curriculum barriers and encouraging cross-disciplinary courses;
6. the development of flexible learning strategies.

We shall look briefly at each of these issues in turn, noting responses and innovations that have occurred in the Victorian education system, and the effects that such innovations are having.

1. Coherent Career Paths

The education system intersects with industrial training systems at present in many ways (e.g. through apprenticeship and traineeship systems). While the notion of career paths resulting from this intersection is well developed in the education literature, the practice of implementing it is not. A change is starting to occur in some areas such as the *metals industry* (AC & AC, 1987a). It is worth looking at the current situation in this industry first, to appreciate the need for change.

Within the metals industry the majority of workers are in semi-skilled occupations, and no structured on- or off-the-job training is

available. These workers have virtually no career paths. Their situation is worsened by their limited opportunities, and they have to keep pace with new technologies in the workplace. The minority of skilled workers is confined to those who have completed apprenticeships, which is at present the major avenue of training in the metals industry. In Victoria, apprentices are indentured to one of twenty-four trades, of which the largest are fitting and machining, sheetmetal, boilermaking and automotive. But there is little scope for going beyond a trade-level qualification.

Career progression beyond a four-year apprenticeship is achieved by first completing a trade certificate (of thirty semester units) and a certificate of technology (also thirty semester units). Further progression to degree level is extremely limited, partly because of the length of degree programmes on top of perhaps eight years previous study, but also because the essentially practical orientation of certificate courses is deemed to provide insufficient background in engineering theory.

In fact, movement from apprenticeship to certificate-level study is limited by the length of the courses and the relatively few exemptions available. Further, apprenticeship training in twenty-four separate trades has decreasing relevance in an industry which demands broad and flexible skill applications.

It is against this background that the training proposals accompanying the overhaul of the metal industry award should be seen. This involves a comprehensive set of options including:

1. structured on-the-job training for the existing workforce;
2. new formal traineeship and apprenticeship courses for young people featuring multiple entry points to the industry from year 10 to graduate levels;
3. adult apprenticeships.

Critical elements of this new approach are:

1. the increased quality of on-the-job training within traineeships and apprenticeships to encourage concentration on theory subjects in off-the-job training and to enhance linkage with higher-level studies;
2. the consolidation and integration of trade training to increase the breadth of skills acquisition.

A recent industry initiative, the Victorian Metals and Engineering Training and Career Development Project, funded by the Victorian Government, is already addressing the above points, and is piloting a common core full-time programme across all metal trades in 1988. This pilot focuses on broad-based on-the-job training for first-year

apprentices, and should open up greater opportunities for more intensive off-the-job training.

The metals industry initiative is significant not only for metal workers, but also as a model for other industries. For example, restructuring within textiles, clothing and footwear suggests strongly that survival of the industries will rely heavily on enhancement and broadening of their skill base.

The goal, towards which these initiatives are but first steps, is to achieve a vertically integrated series of qualifications, reflecting systematic enhancement, broadening and deepening of skills, matched against skill-based job categories within each major industrial sector. Such a goal clearly has profound industrial relations consequences — but it is now firmly on the economic and industrial agenda (Carmichael, 1987).

2. Links with Industry

For too long the phrase 'links with industry' has evoked a negative image of industrialists dictating the content of school and the Technical and Further Education System (TAFE) syllabuses, and in effect passing on the costs of vocational training to the public education system. What we have in mind is something quite different. We envisage a creative and constructive interchange, organized principally at school and college level, so that students and teachers maintain a realistic picture of the world of work, and industry plays its part in ensuring that the education system is well equipped and provides access to its facilities and operations.

In Victoria, positive steps have been taken to forge novel links with industry at schools, TAFE and tertiary institutions level. These programmes include: Project School-Industry; Industry Training Development Programme; and the Preston Project.

Project School-Industry. This project, now a part of the Victorian government's *Youth Guarantee* programme, aims to promote interaction between schools and local industry. It introduces young people to work sites, to varied production processes, to commercial procedures, and to the role and practices of trade unions. Students involved in the project gain a much broader appreciation of the significance of work and technological change in their future lives, than in more narrowly conceived 'work experience' and similar

programmes (Cole, 1987). The project is managed by a tripartite steering committee, and now operates in five regions of the Schools Division in Victoria.

Industry Training Development Programme. This programme, which got under way in Victoria in 1988, involves the placement of TAFE teachers in industry to facilitate the development of training in individual firms. These placements can run for a period of up to twelve months. Some teachers are expected to have a specialized role as training development officers, either acting as a one-person unit within a firm or as part of a larger unit, while others could have more general supervisory or managerial roles.

A flexible approach is being adopted to the forms of training developed and provided by the TAFE teachers on secondment. Depending upon the needs of the particular firms, the training provided can take the form of practical on-the-job training, or special courses undertaken in the firms' training facilities. It can be directed towards the provision of basic literacy and numeracy programmes, initial training for recent recruits, advanced training courses or training for older or redundant workers, or towards supervisor and instructor training.

In addition to meeting the more immediate training needs of firms, TAFE teachers on placement are required to develop a training development programme, in conjunction with other relevant members of the firm. The precise nature and scope of the programme is determined by mutual agreement, but generally it is aimed at providing a plan for the development of training in the area(s) covered by the TAFE teacher. It is envisaged that extensive use will be made of flexible learning delivery models in the provision of courses through the Industry Training Development Programme.

The Industry Training Development Programme is an important pilot project which will establish cooperative and constructive links between colleges and local industry. Additional more far-reaching programmes, involving more complex career paths for teachers to allow them to spend more time in industry and government, could be developed if this pilot project is successful.

Preston Project. In November 1987 the Ministry of Education co-sponsored, with the ACTU and the Committee to Review Australian Studies in Tertiary Education (CRASTE), a conference on Industry and Education. This addressed the needs of industry in the north-west

of Melbourne, and considered the links that could be established with local colleges such as Preston College of TAFE, and Swinburne Institute of Technology. The conference initiated a process which is developing into a regional model of industry regeneration and skills formation. The tertiary institutions are seen as nodes around which *flexible manufacturing networks* may be encouraged — on the model of such networks in Emilia-Romagna, Italy and Denmark (Hatch, 1987). The interest of CRASTE in this process lies in its pursuit of an integrated notion of culture which includes, and is indeed centered on, the work experience (CRASTE, 1987).

3. Linkages, Cross-accreditation and Work-study Arrangements

One of the key problems that needs to be tackled is the rigidity and lack of connection between training processes conducted within different institutional or organizational settings. For example, there is little linkage between traineeships and TAFE certificate courses, or between traineeships/apprenticeships and the newly proposed Victorian Certificate of Education (VCE). This has been identified as a major barrier to personal skill development and pursuit of career development on the part of individuals. Indeed, one of the recommendations of the Ministerial Review of Post-Compulsory Schooling (The Blackburn Report) that was accepted by the Victorian government at the time of the Review Report's release in 1985 was:

That cross-crediting of units of study in the upper secondary curriculum into TAFE certificate courses and apprenticeship be further encouraged, and that the Victorian Curriculum and Assessment Board (VCAB) negotiate with the Industrial Training Commission and the TAFE Accreditation Board with the objective of reaching agreements facilitating such arrangements (Blackburn, 1985, Rec. 11).

Unfortunately, progress in implementing this aspect of government policy has been slow.

Articulation is the term used to describe formal links between courses within or across institutions and sectors. Articulation exists when course designs facilitate the progress of students from one course to another. Articulation can take the following forms:

1. *access* to a course on the basis of recognized skills and knowledge gained in previous studies;
2. *exemptions* from one or more subjects because previous work or

study is deemed to be equivalent, coupled with the requirement to take alternative studies to achieve the award;

3. *credit* for appropriate work or previous study without a requirement to undertake alternative studies;

4. *bridging courses* — undertaken in order to satisfy entry requirements/achieve skills necessary to participate successfully in a further course;

5. *advanced standing* — the granting of a block of credits to reduce substantially the length of subsequent studies.

Maximum course articulation which ensures that students can progress through courses at a pace determined by their achievements rather than by abstract course requirements, and/or select subjects from more than one course to devise an individual study programme, could contribute to an increase to retention rates and to individual career progression. We will focus on three key areas:

1. traineeships and articulation with further TAFE courses;
2. traineeships/apprenticeships and articulation with the Victorian Certificate of Education (VCE);
3. cadetships.

Traineeships. One of the more important developments in the area of vocational education and training has been the creation of the Australian Traineeship System. Traineeship packages have been, or are about to be approved, in Victoria in a number of areas, including the Victorian Public Service (clerical, laboratory assistant), local government, hospitality, tourism, legal, secretarial, textiles, clothing and footwear, and general clerical occupations. It is clear, therefore, that with the development of these and other traineeships, young people will have the opportunity to move into a wide range of employment areas which offer well structured and accredited training.

Traineeship programmes will provide off-the-job training in personal effectiveness skills for work in general, broadly based skills which are relevant to a vocational area or employment sector, and on-the-job training in specific skills. There is to be systematic assessment during the training period to measure the trainee's standard of performance. Young people who successfully complete the traineeship receive certification related to both on- and off-the-job training. Trainees who attend TAFE colleges receive a TAFE award which provides entry to further TAFE courses.

In spite of these positive aspects, the fact remains that traineeships on their own provide nothing more than a period of initial training

for young people entering the workforce. In most cases, therefore, further training is required to assure their longer-term career prospects.

While there is provision for trainees to gain credits in further vocational programmes in some course areas, current evidence suggests that there is a systemic reluctance to recognize credit transfer. Hence, in some cases, trainees have to negotiate credits individually. The creation of a coherent career path relies on the formalization of course articulation within and across sectors, and recognition of credit transfers.

Traineeships and the VCE. A further development is the creation of linkages between traineeships and the VCE. For example, it may have been possible to arrange for some young people who leave school early, and subsequently take up a traineeship position, to include one or more VCE units in their training programme. This could provide the basis for progression to subsequent higher-level courses, and perhaps also encourage some to resume their general education at a later date. It should also have some appeal to employers, since it would provide them with young employees who are more likely to be able to move into more complex and intellectually demanding positions.

Looking further ahead, it may be possible to consider accreditation within the VCE for training and employment experience gained within a traineeship or apprenticeship (remembering that the experience is part of a formally accredited programme of training, and subject to systematic assessment). This would provide a further inducement for young people who have successfully completed a traineeship to resume their general education. It would also provide a sound basis for obtaining credit within the VCE for work experience and industry based training.

Cadetships. Experience with the Victorian Government's earlier Work/Study initiative suggests that a wide range of young people can be expected to apply for traineeship positions. In response to the expected social diversity, it makes sense to develop a range of traineeship packages, catering for young people with different educational backgrounds, and different levels of ability. The Victorian Ministry of Education therefore created a small number of cadetships for young people. They involve a combination of on-the-job experience and off-the-job training in designated TAFE colleges,

along the lines of the existing traineeships. The cadetships were geared initially towards young school-leavers who had passed their Higher School Certificate, but the indications are that they will be utilized extensively by firms to provide existing employees with the knowledge and skills needed to move into the more specialized technical or supervisory positions. The Ministry is therefore aiming to ensure that there is adequate scope for progression from existing entry-level vocational programmes (such as apprenticeships and traineeships) to the cadetships.

TAFE Associate Diploma courses are being utilized for the cadetships, with the result that the persons successfully completing the programme will receive a recognized qualification. Provision also exists for them to proceed from the cadetship to diploma or degree-level courses (with appropriate credits) at a College of Advanced Education.

4. Breaking Down the Sectoral Barriers

Because of its past pattern of development the education system has come to be rigidly divided into different sectors which are reinforced by industrial relations agreements and community expectations. It is widely agreed that sectoral rigidity is not in the best interests of the system, nor of the community being served. Some interesting cross-sectoral linkages have recently been effected, which show how these barriers may be overcome.

One response to the budgetary constraints which are being imposed on post-secondary education has been the greater sharing of facilities and resources across sectors and institutions. This co-operation has occurred, for example, on a regional basis, through the establishment of local groupings of institutions. The regional groupings consult informally on the course offerings within the particular region, and on such things as course development and teaching, and the acquisition and sharing of facilities and resources. In the Gippsland region, for example, Gippsland Institute already offers some subjects at Bairnsdale, using facilities of the East Gippsland Community College of TAFE, and offered first-year subjects of its Bachelor of Business course there in 1987.

In parallel with the development of these arrangements, the Victorian Post-Secondary Education Commission has aimed to provide a wider range of course options between post-secondary

education sectors. The arrangements of the new Western Institute in Melbourne provide an important example of interaction between the sectors. We anticipate that statutory requirements for the approval and accreditation of courses may also create an additional range of problems for multi-sectoral institutions, and for those institutions seeking to develop new course models such as two-tier and transfer courses. In recognition of this, Victoria created a joint accreditation board for the TAFE and advanced education sectors, the Post-Secondary Accreditation Board, in April 1987. At the national level the establishment of the Australian Council on Tertiary Awards as a national registering body for TAFE and advanced education course, should facilitate greater interaction between the sectors.

5. Breaking Down the Curriculum Barriers

The point has been made by numerous commentators that the successful technologists and engineers of tomorrow will be those who creatively draw from different disciplines. The new technology of fibre-optics, for example, is an amalgamation of electronics and optics that is not taught by any traditional course.

Since the path of future technological development cannot be predicted in advance, we would support a curriculum structure at school, college and university level that emphasizes cross-disciplinary connections. This is not to sacrifice rigour and genuine skill formation in particular disciplines — but it is to argue against the formation of specialists who know everything about their own field and nothing about anything else. Successful examples of such cross-disciplinary courses have been mounted in Victoria, such as the Bachelor of Social Science in Socio-Environmental Assessment and Policy offered by the Royal Melbourne Institute of Technology (RMIT). This course draws together elements from social research, environmental studies, and policy formulation and analysis, building on a basic foundation in mathematics and sciences. RMIT have also pioneered a context curriculum programme aimed at broadening the social understanding of technically oriented students.

Secondly, we see cross-disciplinary courses as serving to contest the philosophy of reductionism which has pervaded science teaching at both secondary and post-secondary level in the past. A reductionist approach, which divorces theory from practice and from its social setting, ends up being alienating. Whereas science ought to be an

intellectual adventure for young people, too often if has been taught as a dreary series of rules and principles divorced from the students' own experience. Cross-disciplinary courses play a role in breaking down this reductionist approach to the sciences and to pedagogy in general.

6. *Flexible Learning*

Flexible or open learning has entered educational vocabulary largely as a description of the application of technology to the delivery of educational programmes. While new technologies of delivery certainly constitute one potential component of open learning, a sole focus in this direction may lead merely to an attempt to replace teachers by technology, without addressing the issue of the quality and relevance of the education and training provided.

Flexible learning should be seen as an educational philosophy which advocates an open, flexible approach both to curriculum development and to the delivery of programmes; that is, an approach which recognizes the role of both teacher and student in deciding what and how to learn, and which also recognizes the potential of technologies to enhance the productivity of teachers and the quality of learning. Such an approach is in marked contrast to a technologically driven approach to instruction, introduced within a Taylorist paradigm.

Flexible Learning Delivery Modes. Flexible learning as an approach to the delivery of education aims to give students more choice and control over the time, place, style and rate of learning. Flexible learning delivery modes can include:

1. audio, visual and electronic educational media;
2. off- and on-campus use of audio/visual course materials;
3. information and administration networking via the use of electronic data banks, bulletin boards and teleconferencing;
4. the use of local community facilities as study centres; and
5. self-paced learning and flexible attendance requirements.

Flexible learning delivery has a long history in Victorian education. It has been employed to address the needs of students living in remote areas of the state, of people in such institutions as hospitals and prisons, and of workers unable to attend regular classes. Open learning arrangements have also been developed to provide greater

flexibility in both the content and the delivery of a wide range of courses. Through these developments Victoria's schools, colleges and universities have acquired considerable experience in flexible learning.

Recent technological advances support flexible learning. Interactive video, for example, where the capacity of a compact laser-read disc to hold thousands of frames of visual material as well as audio channels can be combined with a computer program to give conditional and instantaneous access to data, has tremendous potential to enhance the learning experience for people at all levels of the education and training systems. New developments in artificial intelligence promise to make these video- and computer-based systems extremely flexible and pedagogically advanced, interacting with both student and teacher in a new and more productive fashion.

Flexible Learning and Skill Formation. Skill formation is a central issue of concern in the more flexible, less authoritarian, more participative and democratic workplace of tomorrow. Clearly the skills and knowledge which individuals will require in this workplace — indeed to make this sort of workplace possible — can be learned only if the educational environment itself is participative, democratic and flexible. This is not to say that teachers and students should assume total control of learning, in isolation from the larger social context and economic needs. Rather, what we are talking about is participative decision-making about learning as an integral component of skill formation.

Flexible learning therefore has far-reaching implications for the processes by which we develop curriculum, and for the way we define the roles of teachers and students. Present models of curriculum development for vocational programmes tend to cast both teachers and students in a fairly passive role. In fixing the learning process in advance (or at least constraining variation by specifying a minimum level of competence to be reached by all students) present curriculum models presume an 'ideal type' student and disadvantage anyone falling either side of the theoretical norm.

An open learning approach to vocational curriculum development would acknowledge variable student entry characteristics and needs, and would feature the following:

1. analysis of the needs of students in relation to variable educational backgrounds and occupational destinations;

2. clear statements of skill and knowledge requirements of specific occupations and further study options as a basis for decision-making about individual study programmes;

3. development of a range of broad skill options to be selected according to specific interests and needs;

4. provision for flexible course entry and exit points;

5. provision for the negotiation of learning strategies in order to promote decision-making and negotiating skills;

6. flexible criterion-referenced assessment and provision for student self-assessment;

7. flexibility in choice of delivery modes.

The introduction of traineeships with an emphasis on broad-based skill development has encouraged a move towards more open curriculum development in TAFE courses. In Victoria, the Laboratory Assistant traineeship is a current example of a programme in which students worked with teachers and on-the-job supervisors to analyse skill requirements for their own and related technical jobs, to design a course which was relevant to their needs and potential career options.

Concluding Remarks

In this paper we have sketched out a series of responses from the education system that we feel would contribute to its meeting the challenge of a changing techno-economic paradigm. Our educational institutions can be adapted to the demand for flexibility and information intensity implicit in the new technologies and systems of work organization. As Perez says in her exploration of world structural change:

Social institutional and economic planning innovations are more likely to be viable if based on a deep understanding of both the demands and the potential, both the scope and the limitations of the new techno-economic paradigm. . . . In this context, a basic task would be to detect the main features of the new pattern of techno-economic behaviours based on the potential of the new technology, distinguishing what are merely survival tactics tied to the old paradigm from the more coherent initiatives pointing towards the future. It is upon these new trends that the appropriate institutional configuration must be constructed in this transition period (Perez, 1985: 447).

In focusing our attention on flexible patterns of skill formation, and on the development of broad technological literacy as a passport to

democratic participation, we have sought to highlight the critical points of intersection between the activities of the education system and the dominant work life experience of the majority of the population. It is at these points of intersection where fruitful change can take place.

We do not see 'skill formation' in narrow 'instrumental' terms, nor in any sense as a substitute for cultural formation in the diverse traditions of Australia. We explicitly reject narrow 'vocational', 'instrumental' or 'reductionist' approaches to education. What we do advocate is a much closer linkage between what people learn or ought to learn at work, and what they learn in the broadly defined education system, so that the two experiences communicate with and enrich each other.

This is the context within which we would advocate that equity and social justice issues ought now to be considered. The traditional concern to use the public education system to reduce inequities and inequalities is still valid, but in a context of technological change and the acquisition of technological literacy to cope with this change. The challenge for the public sector is that it must provide this broadened literacy — or face the consequence that private institutions will step in to do so, and limit their intake to an elite. Above all else, we wish to avoid such a disastrous polarization of social skill formation, with its implications for exacerbating income inequalities and undermining the fragile basis of consensus on which all democracies are constructed. We do not underestimate the magnitude of the challenge, nor the extent to which an adequate response will change existing practices — but the cases of change that we cite in Victoria lead us to believe that the public education system is capable of flexibly accommodating to new circumstances, and will remain an essential public resource in the future.

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120

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THE AUSTRALIAN TRADE UNION MOVEMENT AND POST-FORDISM

I. CAMPBELL

I. Campbell, 'The Australian trade union movement and post-Fordism', *Journal of Australian Political Economy*, no. 26, April 1990, pp. 1-26.

Over the past two years discussion and debate in Australia on the future of industry and work has centred on the need for 'micro-economic reform'. The Federal Labor government, employer organisations, and the trade union movement have all sought to translate their traditional concerns into the new language of reform and change at the level of the individual enterprise. This paper examines one aspect of the participation of parts of the trade union movement in this current discussion and debate: the appropriation of what can be called **post-Fordist theories** as a guide to strategic intervention.

Post-Fordist theories suggest that we stand at the threshold of a new era that promises - amongst other things - a reversal of the traditional 'Fordist' policies of labour control at the workplace in favour of a new policy of encouragement of the skill and initiative of workers. According to these theories the tide of change associated with restructuring in the advanced capitalist societies is shifting in a way that offers opportunities for the trade unions to realise some of their long-held objectives concerning the content of work. Understandably enough, parts of the trade union movement have readily seized on these theories and attempted to grasp these opportunities.

The following sections are intended to provide both an introduction to the use of post-Fordist theories within the current discussion in Australia and a start to a critique of their limitations. The first section makes two

introductory points concerning the economic and political context. The second section outlines the appropriation of post-Fordist theories, focusing in particular on the writings of Laurie Carmichael and John Mathews. The third section uses these writings as a platform for advancing three points of criticism. The final section summarises the argument and hints at an alternative perspective.

The argument advanced here shares the post-Fordist starting point - that there are major changes taking place in the workplace. It also agrees that these present a challenge for the labour movement. Though the paper does not directly enter into the strategic debates it also agrees that the traditional defensive posture of the trade unions is inadequate and that a new approach that intervenes in the processes of restructuring in order to grasp opportunities and forestall dangers is urgently required. Where post-Fordist theories are seen as deficient is in the actual description and assessment of the changes that are taking place. They offer only a selective interpretation that misses the diversity of restructuring and that as a result exaggerates opportunities and neglects dangers.

Restructuring and Micro-Economic Reform

It is useful to begin by making two points about the general economic and political context for the present discussion in Australia on micro-economic reform:

Restructuring

The current conditions faced by enterprises in the advanced capitalist societies - embracing such elements as changes in the level and composition of demand, intensified competition in product markets, changes in the forms of organization of capital, changes in the regulatory environment, slack labour markets, and the availability of new technologies and new managerial techniques - have created both the incentive and the opportunity for changes at the micro-economic level of the enterprise. Many enterprises, both in Australia and elsewhere in the advanced capitalist world, are increasingly availing themselves of these opportunities in order to restructure their operations in fundamental ways.

The accurate description, analysis and evaluation of these changes is a crucial task for labour-oriented research. There is of course no *a priori* reason for assuming that such changes must possess an internal coherence. On the contrary, a cursory glance suggests that the forms of restructuring vary widely, ranging over all the dimensions of the operations of the firm, including such fundamentals as location, financial structure, and business strategies and extending to embrace accelerated innovation in product and process technologies, experimentation with new forms of work organization, new job design, and differentiation in employment practices. These changes in turn have a varied impact, direct or indirect, both on the workforce employed within these firms and on the structure of the economy as a whole.

Given the diversity of conditions faced by individual enterprises and the diversity of resources that they are able to deploy, such variation is not in principle surprising. But it is also possible to note that even enterprises in similar circumstances have adopted quite different forms of restructuring. Indeed this variability in response is one of the features that contributes to the novelty of the current period. It is appropriate to characterise the current period as one of widespread questioning of past approaches and of experimentation with new approaches in the field of work.

Micro-economic reform and award restructuring

In the past two years there has been a significant shift in policy focus within Australia, away from the broader macro-economic conditions of industrial development to the micro-economic conditions and constraints affecting economic performance at the level of the individual enterprise. This shift in focus has involved government, employers and the trade unions. In particular, micro-economic reform has become a major theme of government discussion and policy. The emergence of the theme can be traced through a number of key discussion documents (e.g. BIE, 1986; EPAC, 1988) and has already been expressed in a number of initiatives (e.g. the National Industry Extension Service).

The scope of the shift in policy focus towards the micro-economic level is wide and has also come to embrace an agenda for labour market reform (see DIR, 1988). While labour market reform can be pursued in a number of ways, one major focus has naturally been on the principles governing

wage determination. As a result much attention in the debate around micro-economic reform has come to be centred on the current initiatives to reorganise the patchwork of awards and to alter the principles of wage determination through the process of **award restructuring**. This in turn is an aspect that has a direct and immediate impact on labour and the trade unions.

The broad significance of award restructuring lies in the fact that it offers the prospect of the introduction of elements of decentralization into what has previously been a highly centralized system. An element of decentralization emerged first of all in the wake of the decision of the Australian Conciliation and Arbitration Commission (ACAC) in March 1987. According to this decision, so-called 'second tier' wage rises to a ceiling of 4% were to be offset by productivity improvements at the enterprise level agreed to by employers and trade unions under a principle of 'restructuring and efficiency'. In manufacturing and in particular in the metals and engineering sector - where the negotiations on the second tier were most extensive - the results included measures such as the removal of certain restrictions on the spread of ordinary hours, on the allocation of rostered days off and overtime, and on the use of casual, part-time and sub-contract work (Rimmer and Zappala, 1988; Frenkel and Shaw, 1989; Reilly, 1989; cf McDonald and Rimmer, 1988). This was succeeded by the decision of the Commission in the August 1988 National Wage Case to introduce a similar 'structural efficiency' principle as the key element in a new system of wage fixation. Parties were encouraged to examine and restructure their awards with a view to introducing measures that would assist the development of a more highly skilled and flexible labour force (ACAC, 1988). Since that time efforts have been devoted to restructuring the relevant awards in accordance with the guidelines sketched out by the Commission.

Employers have long demanded a turn away from centralized wage-fixation towards a system that provides more scope for enterprise-level bargaining, where wages and other conditions can be adjusted to allow for 'local circumstances'. The lure of 'flexibility' is overlaid here by a widespread feeling that enterprise-level bargaining promises to shift the main terrain of negotiations to an area where management is strong and resourceful and where employees are subject to a more pressing and more immediate sense of community of interest with their employer. Employer demands for such a turn have acquired added urgency in the most recent

period, as management has cast around for new solutions to its difficulties and as the independent strength of the trade union movement has ebbed away. Although currently divided into a conservative and a radical-right faction according to how they see a more decentralized system emerging - whether within the framework of the present system or by a radical turn towards individual collective bargaining contracts on the U.S. model - employers take their starting point from a shared, long-standing agenda. This defines the problem in terms of labour costs and 'restrictive work practices'. They therefore approach the discussion on award restructuring with a set of demands that seeks to maximize the elements of decentralization and that includes the opportunity for more flexible deployment, more flexibility in working hours and an increased use of contract labour (see e.g. Evans, 1988; BCA, 1989).

What at first glance is more surprising is that the trade unions are also willing to accommodate the introduction of elements of decentralization. Although in the recent past the trade unions had vigorously defended the centralized system against the criticisms of the employers, much of the initial impetus towards award restructuring in fact came from the trade unions, in particular the left of the trade union movement grouped around the metal trades federation of trade unions. In addition the trade unions have been responsible for many of the specific suggestions concerning the content of the restructured awards and at least to some extent they continue to hold the initiative in the ensuing negotiations.

Part of the explanation for the trade union attitude can be found in the immediate benefits for members, including the change in pay rates and the prospect of an expanded training system. A key element of award restructuring from the point of view of the trade unions is the enhanced skill formation for their members (multi-skilling), to be pursued through a revamped training system and - at the level of the enterprise - the broad-banding of job classifications, a new career structure, and new consultative structures (which would in turn move on to consider the contribution of work organization and job design to skill formation).

But underlying this is also the way in which award restructuring is seen as an avenue for pursuing the long-standing trade union concern with industry policy. Since the early 1980s, and with particular emphasis in the early years of the federal Labor government, many trade unions have sought to address the broad needs of their members in manufacturing

industry by pressuring the federal government to implement positive assistance measures directed at encouraging the regeneration of manufacturing industry (e.g. MTU, 1984; see Ewer, Higgins and Stevens, 1987). Award restructuring has come to be seen as a lever for achieving conditions at the enterprise level that are necessary for such regeneration. It is seen as a lever for encouraging one form of restructuring from amongst the flurry of initiatives presently pursued by management. From this point of view the interest in award restructuring is part of a broader perspective identified with 'strategic' or 'political' unionism (see ACTU/TDC, 1987; Frenkel, 1988; Flew 1989). It can be judged on the one hand as an extension of the traditional left policy on investment agreements and on the other hand as a change of emphasis from the so-far relatively unrewarding effort to affect government industry policy at the macro-economic level to the more promising and more familiar level of seeking to affect employers' practices within the enterprise.

The outcome of award restructuring is still uncertain and it is possible that the negotiations may yet be swamped by the general frustrations and concerns around the level of real wages. Even if this fails to eventuate, it is not yet clear to what extent the more valuable elements of the trade union claims, e.g. on training, will be realised. Moreover, whatever the extent of success in the negotiations, the specific result in the individual enterprises and industries is bound to be highly variable. Nevertheless, it is also clear that the approaches taken up by the negotiating parties seem set to remain an important part of the industrial relations scene and to have a continuing impact for years to come.²

2 Mention should also be made of the role of the Federal Labor government, which has lent its weight to the movement around award restructuring by endorsing the idea of enhanced skill formation in industry (ASTIC 1987; Dawkins and Holding, 1987) and by pushing forward discussion of new initiatives in industry training (Minister for Employment, Education and Training, 1987, 1988, 1989). The April 1989 Economic Statement provides an account of the government's approach to award restructuring (Treasury, 1989, 63-4, 27-31). Subsequent discussion has proceeded to examine the possibilities in the training area, including the proposal for a minimum training requirement (MTR) to be imposed on individual enterprises (see Employment and Skills Formation Council, 1989). What would happen with a change of government in the Federal sphere in 1990 remains an important, still open question.

Post-Fordist Theories

The swirl of activity in Australia around micro-economic restructuring, whether as simple managerial practice or as an item of negotiation and struggle within the processes of collective bargaining, has proceeded with very little academic scrutiny (although for metals and engineering see Frenkel, 1987a, 1987b; Bramble, 1988). But this does not mean that there is no theoretical content or significance in the efforts of the individuals involved with this activity. Employers have taken up some of the ideas and techniques of labour market flexibility that have arisen in the management-oriented literature from overseas. This literature has filtered into Australia, partly through the medium of the OECD (OECD, 1986), although a separate influence has also been the British literature on the 'flexible firm' (e.g. NEDO, 1986).

The trade unions and a number of commentators sympathetic to the labour movement have also taken up theoretical work in order to orient and justify their endeavours. There has been some influence from the management-oriented literature favoured by the employers, in particular through the forums where employers and trade unions are thrown together (NLCC, 1987, 1988; CAI-ACTU, 1988). But more important has been the somewhat distinct body of work from a left-liberal or socialist perspective that has propagated ideas of 'post-Fordism'. It is this major body of work that provides the focus for the remainder of the paper.

In their most popular and influential form post-Fordist theories argue that the advanced capitalist societies stand at the threshold of major changes in production work and, extending on from this, major changes in the regulation of labour and the general structure of the economy and the society. These changes are seen as marking a transition from a Fordist model of production to a new model of post-Fordism. Much of the focus of the argument is on the implications of these changes for labour. Spurred on by such factors as the alterations in product markets and the opportunities offered by new micro-electronic technologies, many firms are seen to be under pressure to adopt new policies towards their workforce and to introduce new forms of the organization of work. In contrast to the traditional labour policies, identified with Taylorism or Fordism, it is argued that there will need to be a new regard for the contribution of human labour in production and a new concern to enhance this contribu-

tion by upgrading skills and by devolving responsibility to the shop floor. Evidence for the beginnings of new labour policies is detected in some of the current restructuring initiatives and it is argued that these are likely to be more widely diffused as restructuring gathers further momentum. In short, post-Fordist theories offer an interpretation of current initiatives in restructuring that stresses their positive potential for shop floor workers³

The genealogy of these ideas within the current debates in the UK, the US, France and West Germany is relatively clear. A central axis in the discussion is provided by the work on Fordism and the crisis of Fordism from the French regulation school, although this work has filtered into the English-language debate only slowly and indirectly (Aglietta, 1979, Leborgne and Lipietz, 1988, Lipietz, 1986, Lokjine, 1986, Palloix, 1976, Coriat, 1980, Boyer ed., 1988). More directly influential has been the work of Michael Piore and Charles Sabel, who on the basis of a parallel analysis of the crisis of mass production postulate a crucial historical juncture that offers a choice between perpetuating the model of mass production and revitalising a form of craft production ('flexible specialization') centring on the production of specialized goods with general purpose machinery in small firms dominated by craft workers (1984). Piore and Sabel's argument pivots on alleged changes in the composition of demand but other work in English has heavily stressed the role of new technology. Important here has been the current work - itself partly influenced by the French regulation school - on technological paradigms and long waves of development, associated in particular with

- 3 This summarises the dominant current within the post-Fordist literature. Some writings are far less sanguine about the implications for labour of the new post-Fordist era and have pointed to trends towards polarization. Others with a similarly critical slant have hesitated to talk of post-Fordism and have preferred to designate the emerging new system as one of neo-Fordism. What remains common to the literature is the structure of the argument, based on a narrative that introduces Fordism, the crisis of Fordism, and then - at least in most cases - the new post-Fordist era.

the SPRU at the University of Sussex (e.g. Freeman, 1987; Perez, 1983, 1985; see Blackburn, Coombs and Green, 1985; Roobeck, 1987). Somewhat separate influences include the more traditional academic literature interested in the impact of technical change as well as the industry policy discussions of writers associated with the Harvard Business School. Also of significance has been the rich tradition of industrial research in West Germany, some of which can be seen as providing an important, parallel discussion of post-Fordism (Kern and Schumann 1984, 1987; Sorge and Streeck, 1988).⁴

The reception of post-Fordist ideas in Australia

Post-Fordist ideas would in any case be treated seriously and welcomed by trade unions, since they promise an extended area of overlap between the dynamic of capital and a number of long-standing union demands. For the Australian trade unions they proved particularly welcome, since these ideas could be easily grafted on to the pre-existing discussion of industry policy. Post-Fordist ideas seemed to provide a basis for extending to the micro-economic level the co-operation with employers that the trade unions pursued at the macro-economic level. They seemed to provide a congenial micro-economic recipe for the competitiveness that the unions were determined to introduce into industry, offering comfort that changes in the direction of increased competitiveness can be in the narrow as well as the broad interest of workers employed in industry. In particular they seemed to justify a major effort to upgrade the skills of the workforce in order to get a foot up onto the ladder leading to the new post-Fordist era.

The reception of these ideas can be traced back to the earlier work on industry policy, in particular as this extended to the micro-economic level

4 Again it is useful to signal the variation in this body of writings. For example, Piore and Sabel prefer to speak of 'mass production' rather than Fordism. Similarly the alternative they foreshadow is not referred to as post-Fordism but 'flexible specialization'. This reflects their contention that mass production and craft production are historically coterminous alternatives whose origins and competitive relations predate the twentieth century. Similarly, Sorge and Streeck distance themselves from the notion that new technology or new market conditions will bring into being a new system of production. Instead they prefer to speak of a 'loading' towards an alternative that has always been present ('diversified quality production').

in the efforts to develop specific agreements on work practices and training within the context of the heavy engineering package. These ideas appeared first of all in the work on the importance of skill formation (e.g. Ford, 1986; Curtain et al, eds., 1986; Curtain, 1987). More broadly they surfaced hesitantly in some of the earlier commentaries on industry policy (Ewer et al, 1987) and again hesitantly in the report of the ACTU/TDC mission to Europe (1987; cf MTIA/MTFU, 1988). But it is in the recent period that they have been presented most directly - in particular in the influential speeches and interviews of Laurie Carmichael (e.g. 1988, 1989) and in the extensive recent writings of John Mathews (Mathews, Hall and Smith, 1988; Mathews 1988, 1989a, 1989b, 1989c; Badham and Mathews, 1989). The ideas played a prominent role in the initial impulse towards award restructuring and continue to exercise an important influence in the subsequent negotiations. From this point the ideas have spread well beyond the work of a number of individuals and they have come to inspire the efforts of a broad layer of activists involved with the work of government as well as trade unions.

The writings of Carmichael and Mathews deserve careful attention. Laurie Carmichael, one of the leading figures in the union impulse towards award restructuring, first from within the AMWU and then most recently from within the ACTU, has outlined his views in a recent interview and speech (1988, 1989). He situates the union initiatives around award restructuring within a broad theory of changes in production work since the turn of the century. He argues that present-day systems of production represent a particular stage of development that was inaugurated by the technological revolution of the turn of the century, marked on the one hand by the mastering of electrical processes and the development of the internal combustion engine and on the other hand by the theories of scientific management. He suggests that we are currently proceeding through a technological revolution of comparable magnitude and significance, marked first of all by the emergence of micro-electronic technologies. These technologies are seen as making possible greater flexibility in adapting to changing demand, greater speed in responding to orders, and improved product quality (1989, 26). Most importantly, he goes on to suggest that they make possible - or even require - a new approach from management to the workforce. In place of the traditional Taylorist system, based on a narrow detail division of labour, limited task autonomy, deskilling, and authoritarian control from management, a new system,

based on multi-skilling, increased responsibility and enhanced industrial democracy at the workplace, is now required. For Carmichael, it is the technological revolution that provides the impetus for the trade union initiatives.

Carmichael's argument is only fragmentary and does not gesture much beyond a conventional emphasis on the imperatives of technology. A more elaborated position and one more self-consciously within the tradition of post-Fordism has been advanced in the recent writings of John Mathews, in particular in *Tools of Change* (1989a), where he seeks to provide intellectual support for a positive trade union intervention, and in the more recent article co-authored with Richard Badham (Badham and Mathews, 1989), which offers an ambitious conceptual framework designed to help in clarifying some of the issues in the debate around post-Fordism.

The structure of Mathews' argument duplicates that of Piore and Sabel, though he dispenses with some of the more romantic touches, e.g. the paean to the opportunities for small firms and craft workers, and he places more emphasis on the impact of new technologies. He begins with the familiar argument that the present organization of work conforms to a model or paradigm of 'Fordism'. He suggests that external shocks together with the internal contradictions of the model have initiated a crisis of Fordism, whose effects are being felt today in the advanced capitalist societies. In response to the crisis, management is experimenting with new strategies. The classification and characterization of these strategies has shifted as Mathews has developed his argument in different texts. However, in general he suggests that they can be broadly divided into two groups: on the one hand a continuation of the old model in one form or another, which he discusses in terms of Fordism and neo-Fordism, and on the other hand a shift towards flexibility and an increased reliance on the input of highly skilled and motivated workers - the post-Fordist alternative. In both strategies the new technologies based on micro-electronics can play a role, either as a new set of opportunities to be pressed within the old mould of Taylorist approaches to labour (as 'Computer-Aided Taylorism') or as the basis for a comprehensive new post-Fordist model.

The main stress of Mathews' work is on this broad contrast between Fordism (including neo-Fordism) and post-Fordism. The focus is on the

prospect of a significant 'paradigm shift' towards post-Fordism and on the implications of this for labour. Flowing on from the suggestion of an increased reliance on skill and motivation, the post-Fordist alternative is presented as favourable to the interests of workers, offering the opportunity for the realization of the long-standing demand for industrial democracy. Mathews goes on to emphasise the need for the labour movement to intervene politically to ensure the triumph of this alternative. This in turn presents a challenge to the labour movement, which has become reliant on and habituated to an oppositional approach. The labour movement must appreciate that the pursuit of its aims no longer means 'swimming against the tide' (1989a, 34-5); it must shift from an oppositional approach to an interventionist, protagonistic approach that Mathews identifies with 'political unionism'.

Assessment of Post-Fordism

There is nothing substantively new as yet in the Australian contribution to the literature on post-Fordism. But there is a distinctive inflection in this contribution, by virtue of the way in which the literature on post-Fordism has been inserted into the existing debates on strategies for the labour movement.

How can we assess these ideas? Discussion and debate on post-Fordism has begun to emerge in the English-language literature, firstly around Piore and Sabel's work (Williams, Cutler, Williams and Haslam, 1987; Pollert, 1988; Hyman, 1988; Sayer, 1988; Wood, 1989; Jenson, 1989; cf Lane, 1988) and then more recently around the extension of the work of the French regulation school into a theme of flexible accumulation (e.g. Schoenberger, 1988; Scott, 1988; Moulaert and Swyngedouw, 1989, Hudson, 1989). A similar discussion can be traced in West Germany, sparked off by the work of Kern and Schumann (see Campbell, 1989). This discussion remains fragmentary and unfinished. At least some of the more critical writings are rather intemperate, coloured by a sensitivity to the political issues that are seen to lurk beneath the surface of the discussion. Nevertheless, the discussion has registered some advances. It has indicated both the weakness of the extravagant characterization of the previous period in terms of a model or paradigm of Fordism/mass production and the contentiousness of the related conception of a crisis of

Fordism/mass production (Williams et al, 1987; Sayer, 1988). Less successful has been the attempt to further discussion on the current period and the significance of the developments to which the post-Fordist writings draw attention.

I don't want to canvass all the points of debate. My remarks are confined to the Australian discussion and to a few general points concerning the assessment of contemporary changes at the workplace. In this way I want to sound a note of caution concerning any over-hasty appropriation of post-Fordist writings.

It is useful to begin by summarising the strengths of the post-Fordist writings. First, these writings introduce a new and promising note into research on the transformation of work. In contrast to theories of post-industrialism, they continue to assume the centrality of work to the social life of society and -moving on from this - continue to give a central place to the analysis of production work. On the other hand, they stand opposed to the thesis of a deskilling of production work that is associated with Braverman's research (1974), thereby opening up the prospect of a fruitful debate on the concrete processes affecting production work. At the most general level, these writings are also useful in the way in which they link concrete investigations of the organization of work and job design at the level of the enterprise to a consideration of general processes of restructuring. At least in principle they break away from a narrow focus on the labour process and gesture to a more sophisticated account of the link between the development of labour processes and the more general dynamic of capitalist accumulation. Most importantly, these writings are useful in drawing attention to the changes currently affecting the workplace. They quite rightly argue that there is something novel in the nature of the current period and in the changes at the workplace as a result of restructuring. They quite pertinently imply that the assessment of these changes is an urgent task for labour-oriented research. Finally, in the case of the Australian work under consideration here, it is also worth drawing attention to the value of work that is firmly anchored in an appreciation of the strategic position and needs of the trade union movement.

Nevertheless, these writings are vulnerable to criticism on a number of counts:

Selective evidence

In presenting evidence for the direction of changes at the workplace the argument is very selective; it considers only some of the changes taking place and excludes many others. The focus is on new approaches to labour. Even more narrowly, the emphasis is predominantly on new skill requirements, whether in the form of new skilled jobs or in the form of new skills for existing jobs. Such new skill requirements are discussed in terms of the development of problem-solving or diagnostic skills, and the fusion of new forms of theoretical knowledge with traditional practical know-how. But this is skill as it appears associated with the use of micro-electronic technologies in selected areas of manufacturing in selected countries. The industry focus is primarily on industries traditionally dominated by small-batch or even customised production such as the machine tool industry. The classic case is provided by the development of programming-at-the-machine in the context of the introduction of CNC equipment. More generally, there is a heavy reliance on allusions to the re-integration of maintenance and quality control with production work in a wider variety of industries including the car industry. More tangentially, there are also references to traditional experiments with alternative forms of work organization, most importantly team work but also forms of job enlargement and job enrichment.

There are a number of points that can be made here. Firstly these changes only concern a minority of (often already-skilled) workers in just a few industries. This would not matter so much if they were the only changes affecting labour and it was therefore possible to argue that they represented trends that could be expected to extend to encompass all or most workers. But in the case of other workers in the same enterprises, in other enterprises in the same industry, or in other industries it is often possible to point to quite different changes and quite different trends, including with respect to skill requirements as a result of changes in product technology. It is difficult to see why new skill requirements should be privileged and examples of developments such as casualisation, increased work burdens, and increased use of sub-contract labour should be neglected.

Secondly, even in the case of the changes that are used as evidence the effects of these changes on labour are approached too uncritically. The criticism is most pertinent in the case of Piore and Sabel, who use their

empirical examples as a platform for launching an implausible vision of a revitalised craft production. But even in the case of more qualified accounts such as that of Mathews, which acknowledges the distance between the traditional craft worker and the new skilled worker, the claims for new skill requirements are not thoroughly scrutinised to separate shadow from substance, temporary from likely permanent effects, and statistical illusions from real changes.

Thirdly, even in the case where the skill effects are substantial and permanent these skill effects are too readily isolated from changes in the other dimensions of jobs, e.g. task autonomy, work burdens and social interaction. It is too readily assumed that skill is the pivotal dimension of work and that an increase in skill requirements for particular jobs leads to an improvement in other dimensions of the job (and indeed working conditions in general). But it by no means follows, for example, that increased skill requirements necessarily imply increased task autonomy, increased social interaction and reduced work burdens. In the case of some skilled automation work such as that of 'monitoring and intervening' (e.g. in the chemical industry) it can be argued that the relationship tends to the reverse. In particular, it is not possible to bracket together skill and responsibility as if the two necessarily went hand-in-hand (Carmichael, 1989; Badham and Mathews, 1989).⁵ In the case of changes affecting jobs it is vitally important to develop a comprehensive view based on a consideration of the effects on all the dimensions of jobs as well as on working conditions in general.

Global models

Perhaps the crucial weakness concerns the way in which the argument illicitly leaps back and forth from the (selected) evidence of change at the

- 5 Badham and Mathews agree that an increase in what they call labour responsibility cannot be taken to imply an improvement in working conditions (1989, 201, 214). But they still bundle together skill and responsibility in their concept of labour responsibility as if these two dimensions were inseparable. The devolution of responsibility should be seen as a quite separate topic to that of skill. It is in fact an important phenomenon and may be far more widespread than changes directed to an upgrading of skills. It is often accompanied by management schemes designed to foster accommodation and an ideological identification with the enterprise

workplace to the discussion of a new global post-Fordist model (or 'paradigm'). Piore and Sabel refer to 'flexible specialization', others speak of 'flexible accumulation', and yet others have taken up the term 'post-Fordism'. In each case the new global model tends to be presented as the necessary sequel to the old global model of mass production/Fordism. The central argument is in fact often primarily situated at the abstract level of postulated transition between these global models, and the evidence of change at the workplace is brought in as simply illustrative examples of the overall trend. In some cases it is the elaborate theoretical superstructure that in turn serves to ratify the selectivity of this evidence, e.g. through the introduction of a distinction between 'post-Fordism' and 'neo-Fordism' (which acts to separate out from amongst the changes that are novel those that do and do not have benefits for labour). The assumptions built into the conceptual framework then operate to designate the former as examples of the trend and the latter as merely a (forlorn) attempt to perpetuate Fordism (Mathews, 1989a, 31-35; but cf Badham and Mathews, 1989, 208, 233).

The result of this focus on global models or paradigms is an 'overburdened dualism' that is unjustified and that inhibits a proper analysis of the current changes at the workplace. Part of the problem here undoubtedly stems from the way in which the previous period is itself conceptualised in terms of a model of Fordism/mass production. This ascribes a false homogeneity to the previous period and the forms of production encountered in this period (Williams et al, 1987; Sayer, 1988). As well as being historically dubious, such a conceptualisation can also be seen, most importantly, as encouraging an abbreviated and inadequate analysis of changes in the current period. Any development in the current period that seems to depart from the old model is assigned an often-spurious degree of novelty and significance. Moreover, insofar as the old is regarded as hostile to labour, there is a tendency to view new developments with an often-exaggerated degree of enthusiasm that overlooks their heterogeneity and internal contradictions. Finally, in line with the homogeneity ascribed to the previous period, there is a tendency to treat all developments that appear genuinely new in the current period as merely components of another homogenous model of production. In short, the appeal to a model of Fordism/mass production encourages a pre-judging of the novelty, significance, promise and cohesion of new developments. This is to rush over the very aspects that need to be carefully assessed.

Where does the notion of a succession of models in fact come from? It is difficult to find an explicit justification for this notion in the literature, although the implicit appeal - raised in the use of the term 'paradigm' - is to a parallel with the progress of research in natural science (or, more contentiously, to a parallel with the progress of technological invention). But this parallel is misleading, since it overlooks the basic fact that the practice of capitalist enterprise, in sharp contrast to the practice of science, is geared to the production of pre-determined results - an adequate rate of profit - and tends to be *ad hoc*, open and tolerant of diversity in its methods, so long as this end-result can be secured. The role of an intellectual framework - represented in this case by the managerial strategies - is relatively restricted and modest, oriented to organising the material conditions for valorization in appropriate quantities and then co-ordinating their combination. Though it is true that unreflected, shared cultural assumptions play a part in this process, to talk of paradigms is to exaggerate their role and to neglect the controls imposed by the material conditions themselves as well as the continuous test associated with the realization of value in the marketplace.

The problems of positing dominant models of production are reflected in the choice of the dimensions of the enterprise that are used to construct the models. In a somewhat similar fashion to the traditional labour process literature, the focus is primarily on the relations between management and the workforce. The models are conceptualised in terms of managerial strategies that are understood as pivoting around distinctive attitudes towards labour, whether hostile and suspicious of worker initiative or accomodating and receptive of worker initiative. But this is to ignore one of the central conclusions of the labour process debate: that it is not possible to treat the relationship with labour as the key to the analysis and categorisation of different managerial strategies, different forms of work organisation, or different enterprise structures.

The elaborate superstructure of models and paradigms used in much of the post-Fordist literature clouds the central issues and short-circuits the crucial tasks of analysis. It seems to me that the necessary discussion of contemporary developments at the workplace could proceed more fruitfully if we could strip away this superstructure. Interestingly enough, the recent article by Badham and Mathews does take some steps in this direction, first by introducing a useful distinction between production

process, production strategy and production paradigm, and then by suggesting that the current period should be seen as characterised by the emergence of a number of competing paradigms. Though this is useful the discussion does not proceed to a clear account of the number of paradigms and the basis for their differentiation. Indeed in the presentation and elaboration of their conceptual framework the discussion reverts to the familiar territory of a tripartite division between Fordism, neo-Fordism and post-Fordism. It remains unclear whether this division is seen as directly derived from the three dimensions used to construct the framework (one of which, characteristically, is labour responsibility) or whether it is seen as merely a convenient way of marking out the 'production space' defined by the framework. But in either case it remains vulnerable to the objection that such a division is arbitrary and of little use in clarifying the nature of the changes taking place in the current period.⁶

Political and social choices

The post-Fordist argument also fudges the issue of political and social choice. This problem runs through much of the post-Fordist literature, which tends to rely heavily on a long chain of causal connections linking background factors such as new technologies or new structures of final demand to strategies of enterprises and then to new forms of labour policy. This can take various forms, with some versions relying on a chain forged from different dimensions of 'flexibility'. At one extreme the literature shades off into a fairly open form of (technological) determinism (e.g. Adler, 1986), but even in cases where the intention is to clarify the causal connections in a non-deterministic way, there is ample evidence of

6 An indication of these problems can be found in the rather heavy weather made by Badham and Mathews of incorporating evidence of new developments counter to the more rosy predictions associated with post-Fordism. Features such as intensification are seen as compatible with (one form of) post-Fordism, but other features such as skills polarisation are, for reasons that are left a little unclear, assigned to neo-Fordism (1989, 224-5, 230-1; cf Mathews 1989a, 38). Badham and Mathews defend their use of these categories in a rather curious way. They stress that generalisations are crucial both to scientific investigation and to practical intervention (1989, 215-216, cf 225, 234). This is quite true. But it blurs the vital point that the generalisations must be apt and the interventions appropriate and effective. The crucial argument advanced here suggests that the abstract categories are not apt and that the interventions they sponsor run the risk of being inappropriate and dangerous.

hesitations and ambiguities (e.g. Sorge and Streeck, 1988). In many cases there is a formal gesture to the possibility of choice, but the actual argument carries along with it all manner of deterministic assumptions.

Much of the problem here is often bound up with the use of an argument couched in terms of global models and paradigms, since this already pre-packages the alternatives into a form that compresses the actual causal relations and constricts the range and depth of the actual choices. Talk of a choice between two or three global models, even if seriously meant, cannot be sufficient to establish non-deterministic credentials, since such a choice does not in fact correspond to the social processes of action and the various points at which choices are made. The point has been made by Williams et al, when they suggest that the argument around flexible specialization virtually abolishes the role of enterprise calculation (1987, 436), but from a somewhat different perspective it is possible to suggest that it suppresses an appreciation of the way in which the dynamic of capital takes effect at the level of the individual enterprise. The result is a perspective that improperly simplifies the choices open both to management and trade unions and that exaggerates the prospects of collaboration between the two.

Similar difficulties are evident in the Australian discussion. Laurie Carmichael argues that the modern technological revolution demands a new approach to labour. He suggests that there is no automatic cause and effect relationship between the two and that human intervention is required in order to ensure that the positive potential of the technological revolution is realised (1989, 27). There is the hint of a choice here but it is one that is tightly constrained. The choice is between fulfilling the demands of the technological revolution and thereby bringing it to a successful culmination or resisting these demands and suffering dire consequences. A choice remains but it has shifted on its axis; it is not a true choice between alternative paths of development but an enfeebled semi-rhetorical choice between progress and stagnation.

A related tension can be detected in the work of John Mathews. Mathews stresses strongly the general issue of choice. He eloquently criticises (technological) determinism and much of his work is oriented to articulating political choices available to the labour movement. In connection with the issue of the future shape of work he stresses the possibility of choice between the two alternatives of Fordism and post-Fordism and he

goes on to argue that "the 1990s will provide the real-world 'laboratory' in which these 'competing paradigms' will be tested and refined" (1989b, 144). But already here we can see the way in which the alternatives have been pre-packaged and the range and nature of the actual choices compressed. Moreover, at the same time, even this restricted choice tends to be redefined in a fashion similar to Carmichael. Thus Mathews is concerned to stress the optimality of the second choice for management (e.g. 1989a, 34-35). He argues that productivity gains with new technology, e.g. flexible manufacturing systems, cannot be achieved by firms that introduce these along the old lines but can only really be achieved within the framework of the second strategy. The neo-Fordist path fails to appreciate the premium that is being placed on a highly skilled and motivated workforce. He suggests that a deskilling design philosophy is taking industry "down the road to oblivion", whereas firms which follow an upskilling strategy "are starting to reap the economic rewards" (1989a, 126, 127). For Mathews, a central point is that industrial democracy is now "a matter of economic survival" (1988, 20, 23). These flourishes undermine any notion of a true alternative between the two approaches; they reduce the choice once again to one between progress and stagnation, survival and death, success and failure.⁷

There is one qualification that should be made. At least in some of his writings Mathews also gestures towards alternatives within the post-Fordist model. In *A Culture of Power* he refers casually to an alternative identified with the New Right, which entails a form of post-Fordism that by-passes the trade unions and is characterized by "a determined drive to involve workers individually" (1988, 23-24). This reappears in a more elaborated form in *Tools of Change*, where it is discussed first of all as a

7 There is more than a hint here of the old argument, characteristic of the heyday of the 'work humanization' initiatives, that management does not recognise its own true interests (which overlap with the interests of workers) because it is blinded by outdated ideology. This presents workers and their unions with the responsibility and opportunity to 'lead' the employers (cf Mathews, 1989a, 183). The main problem with this argument is not that it implies an effort to assess the implications of management initiatives for productivity and profitability and to explore the degree of overlap between the interests of management and workers. Such an effort is vital. The problem lies with the use of a binary opposition that scrambles the palette of choices open to both management and workers into a simple alternative of just two choices. A healthy regard for the capabilities of management and a healthy scepticism about the implications for the workforce of its initiatives are two ingredients of a much better approach.

'skills polarisation' strategy, seen as based on the abandonment of Taylorism for the few but the retention of unskilled work under conditions of casual employment for the many (1989a, 38, 3-4). This is again presented in tandem with the New Right and its strategy of "by-passing unions, resorting to common law to settle industrial disputes, promoting enterprise bargaining, and so on" (1989a, 161). For Badham and Mathews skills polarisation is pushed away into neo-Fordism, but a space is still left for alternatives within post-Fordism, dependent on whether or not the increased skill and responsibility that is delegated to workers is used as the basis for improved working conditions and increased 'worker autonomy' (1989, 214, 200-202).

Given that this is an alternative within post-Fordism then it does qualify as an issue of genuine choice. And indeed when Mathews poses this alternative he also gestures to the pressing need for union intervention in order to forestall the more management-oriented path to post-Fordism (e.g. 1989a, 38, 161). However, what is noteworthy is how shadowy this alternative remains, lacking any clear definition. It is poorly integrated into the argument and raises more questions than it answers. How does this alternative relate to the use of new technology? How does the trade union movement ensure that its strategic intervention doesn't help to consolidate such a path?

Conclusion

If we dispense with the post-Fordist conceptual framework of global models, with its over-simplified choices and dubious causal connections, we are left with the evidence in this literature of certain changes at the workplace, associated in particular with new skill requirements. This is undeniably useful and does pose important issues for trade union action. However we are left with the problem that this evidence is only selective and as the foundation for a comprehensive analysis of the current period and of the tasks facing the trade union movement it is far too fragile.

It seems to me that a more appropriate conceptual framework would need to be situated at a quite different level. What is novel about the current period is not so much that it reveals certain new types of labour policies - although it does reveal these - but rather that restructuring has a new, intensified character, marked by the number of firms engaged in some

form of restructuring and by the depth and variation in their responses to the conditions they face. What is involved can be aptly described as a cluster of restructuring initiatives. From this point of view the post-Fordist literature is deficient in that it grasps only one effect of the restructuring initiatives and falsely presents this as a (likely dominant) form of restructuring. It thereby misses both a number of important dimensions of restructuring, e.g. financial integration, and the variation in the forms of restructuring.

It remains true that labour-oriented research must be vitally interested in the current and likely future effects of restructuring initiatives on labour and in the prospects for intervention. Here it is not easy to point to an alternative analysis that captures the range of changes and the relative significance of the varied trends. Some useful research has been done at the general level of restructuring with respect to forms of corporate reorganization, sectoral shifts in employment, the decline of individual industries and the spatial redistribution of production. But this has largely concerned aggregate job loss (or job gain). Little attention has been given to forms of restructuring at the micro-economic level of the individual enterprise and their effects on labour. There have been partial accounts that have captured, in a similar way to the post-Fordist literature itself, particular aspects of the trends affecting labour but no comprehensive analysis.

The task for labour-oriented research must be to build such an analysis. As well as the trends singled out by the post-Fordist literature it will also be necessary to grapple with trends that have eluded attention and that run counter to the positive image of the future presented in this literature.

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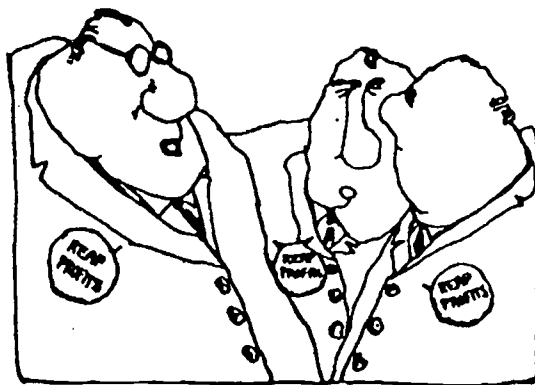
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CIRCUITS OF CAPITAL AND INDUSTRIAL RESTRUCTURING: ADJUSTMENT IN THE AUSTRALIAN CLOTHING INDUSTRY

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SUMMARY: Patterns and processes of industrial restructuring in the Australian clothing industry are examined, utilising a 'circuits of capital' approach in which the interrelationships between labour markets, labour processes and product markets are emphasised. Changes in product markets (where import competition is intensifying under the trade liberalisation policies of the Hawke government and where an increasingly concentrated retail sector has accrued enormous bargaining power in its dealings with clothing manufacturers) and changes in labour markets (where competition for the industry's traditional inner urban labour supply has intensified considerably) are argued to have provided the driving force behind the process of clothing industry adjustment. This process of adjustment has been characterised by: (i) increased use of outworking, which enables clothing manufacturers to reduce production costs and provides a means for new sources of home-based labour within the urban labour market to be tapped; and (ii) the evolution of a spatial division of labour, as some of the labour-intensive components of the industry have been relocated to non-urban sites where a stable and plentiful labour supply is available. In contrast to experiences in Europe and the United States, there is little evidence in Australia at the present time of significant technical change nor of specialisation in the high quality/high fashion niche of the garment market.

The last decade has been a traumatic one for the Australian clothing industry. Never having fully recovered from a sharp recession in the mid 1970s, the industry was plunged into further difficulties in the early 1980s, as low-priced imported garments began to take a significant share of the domestic market. Government assistance in the form of tariff and quota protection had halted, or at least slowed, this precipitous decline in the early 1980s, but showed no signs of stimulating a much-needed phase of positive restructuring in this notoriously backward sector. Recently, it has been announced that these trade barriers will be gradually removed, thereby allowing market forces to dictate the pace and form of restructuring.

Pressures for structural change in the clothing industry in recent years have originated from two sources: the product market and the labour market. Profit margins in large parts of the industry have been considerably reduced as price competition in the domestic market has become increasingly fierce, a situation prompted by severe import competition at the discount end of the market and by retailers' strategies to maintain their shares of the consumer market. The pressure to cut production costs which these tightening profit margins induced has led to attempts to reduce labour costs. This has only exacerbated the labour market problems experienced by the industry, where high labour turnover and skill shortages have become endemic. Forced to find labour process 'solutions' to these deep-rooted problems, within the context of a basically static set of production technologies, clothing manufacturers have frag-

mented and relocated their production processes, trends reflected in the growth of industrial outworking and the relocation of labour-intensive elements of the production cycle to non-urban locations.

The purpose of this paper is to review and critically assess the available evidence on the restructuring of the Australian clothing industry; and following this, to draw out some themes for future research. The paper begins by sketching the theoretical context, briefly examining the conceptual bases of industrial restructuring research. This is followed by an exploration of the process of restructuring in the clothing industry, where changing conditions in product and labour markets, and in the regulatory activities of the state, are shown to have exerted significant influences upon the process of industry adjustment.

INDUSTRIAL RESTRUCTURING, THE LABOUR PROCESS AND CIRCUITS OF CAPITAL

The process of industrial restructuring has been the subject of considerable theoretical and empirical research since the late 1970s (for reviews, see Bradbury 1985; Storper 1987; Wilds and Fagan 1988; Morris 1988; Walker 1988). This research stemmed from a concern, shared by many geographers working within a political economy framework, to establish links between the process of capital accumulation and the changing spatial structures of industrial production and class rela-

tions. The analytical focus of much of this work has been placed upon capital-labour relations within the production process, contrasting sharply with the long-established tradition of neoclassical economic geography (Storper and Walker 1984). Inspired by the work of Braverman (1974), industrial restructuring research identified the labour process, in which capital was engaged in a constant struggle to maintain its control over labour, as the central dynamic of industrial change (Webber 1982; Morris 1988; Warde 1988).

With its emphasis on class relations at the point of production, industrial restructuring research has highlighted many of the important links between the changing geography of industry and the imperatives of capitalist accumulation. Capital, engaged in a perpetual search for more profitable sites of accumulation, was seen to be abandoning the traditional industrial regions in favour of areas with a less costly and more tractable labour supply. This implies a 'double movement' of capital: firstly, within the advanced industrial nations themselves, a spatial shift in employment was observed, away from the old industrial cities and towards non-metropolitan areas; secondly, a global-scale shift of production from the advanced industrialised nations to the third world was in evidence (see Peet 1984; Dicken 1986). Some studies highlighted the higher rates of profit which could be obtained in these low-cost locations (Carney 1980; Froebel *et al.* 1980; Frank 1981; Trachte and Ross 1985), while others focused upon capital's need to escape the highly-unionised traditional industrial centres with their rigid, institutionalised labour processes (Gordon 1978; Clark 1981; Webber 1982; Peet 1984). More recently, some industrial geographers have sought to link this search for 'new industrial spaces' with the posited crisis of Fordism and the ascendancy of a regime of 'flexible accumulation' (Leborgne and Lipietz 1988; Scott 1988).

There remains, therefore, an emphasis on the labour process as the analytical 'anchor' of the process of industrial restructuring. While this approach continues to yield useful insights, there have been calls from some quarters for a more comprehensive treatment of the process of industrial change. Specifically, it has been argued that a more sensitive appreciation of the role of labour and product markets is required (Storper and Walker 1983, 1984; Sayer 1985; Walker 1988). This is an argument which has been echoed within the labour process debate itself (see Jones 1982; Wood 1982; Thompson 1983; Littler and Salaman 1984; Bray and Littler 1988), where there has been a thorough theoretical and empirical re-evaluation of Braverman's (1974) seminal, though flawed, work. This critique has produced the following insights: firstly, the strategies of deskilling and the subdivision of work tasks are not the only ones available to capital within the accumulation

process, neither are they the most effective in all circumstances; secondly, capital-labour relations cannot be understood solely in terms of conflict and coercion, but are equally likely to involve cooperation and consent; thirdly, management is not a process confined to the management of labour, and even in those cases where it is, labour relations are themselves influenced by 'external' changes in markets, products and technology; and fourthly, technology is not plastic in the hands of management, but poses significant problems of application and control (Morgan and Sayer 1985).

Due to its almost exclusive focus on the conditions surrounding the extraction of surplus value within the production process, labour process theory was destined only to achieve a partial grasp of the overall process of industrial change under capitalism (Elger 1979; Kelly 1982). Hence, it has become necessary for labour process theory to 'look over the factory gates', to trace the links between changes in the labour process and the dynamic of the capitalist system lying beyond the immediate process of production (Peck and Lloyd 1989).

John Kelly, in highlighting the narrowness of some labour process research, argued that it is necessary to take account of the *full circuit of industrial capital*, a circuit which can be seen to run from the *purchase of labour-power* (within the labour market), through the *extraction of surplus value* (within the labour process), and to the subsequent *realisation of surplus value* (within product markets). In order to fully integrate this conception within an understanding of the overall dynamics of the process of accumulation, it is also necessary to take account of the *reproduction of capital*, as surplus value, realised in the form of money, is reinvested in the production process'. Kelly (1985: 32) could find 'no sound theoretical reason for privileging one moment in this circuit — the labour-capital relation within the labour process — if [the] objective is to account for changes (or variations) in the division of labour'. Labour and product market influences upon the process of industrial change should not be subordinated to labour process considerations; each should carry equal analytical weight. Following from this, there is a need to study carefully the ways in which these three moments within the circuit of capital articulate with one another:

The full circuit consists of a set of processes each of which is fitted together, or articulated to varying degrees: firms try to match the qualifications and attitudes of workers to their particular labour process; they endeavour to organise the labour process in such a way that it efficiently and effectively produces the desired commodities for the firm's chosen product markets. Stated in such general terms these points are obvious enough. But what happens when the moments in the circuit of capital no longer

articulate as effectively as in the past? What happens when product or labour markets are rapidly transformed whilst a firm's labour process remains largely unchanged? (Kelly 1985: 33).

A focus on the interplay of these three spheres — the labour market, the labour process and the product market — may provide the basis for attaining a more thorough grasp of the process of industrial restructuring. Indeed, such a broad analytical sweep is essential if contemporary developments in the Australian clothing industry are to be comprehended, because this is an instance in which labour and product markets have exerted a critical influence upon the process of industrial change.

CONTEXT: THE NATURE OF THE AUSTRALIAN CLOTHING INDUSTRY

The Australian clothing industry has experienced widespread plant closures and job losses in recent years. The industry, which has employed well in excess of 100,000 people for most of this century (Keating 1973), had a workforce of only 75,200 in August 1988 (ABS 1988b). Further job losses are almost certain to follow as the federal government pursues its policy of trade liberalisation (CATU 1986b; IAC 1986), which will see the level of industry protection gradually reduced over the 1989-1996 period. It is likely, then, that the process of restructuring in the industry is about to enter an accelerated phase, as clothing manufacturers are increasingly exposed to the full force of international competition.

A new international division of labour

These Australian experiences must be set within the context of the broader changes which have been evident in the clothing industry throughout the advanced industrial nations. It has been argued that the clothing industry has been restructured on a global scale and that a 'new international division of labour' has emerged, as capital (and employment) has flowed out of the advanced industrial countries towards cheap-labour production sites in the third world (Froebel *et al.* 1980; Dickenson 1986; Park 1988). Countries such as Taiwan and South Korea have made huge inroads into export markets throughout the world, easily undercutting domestic clothing producers in the advanced industrial nations where production costs are comparatively high. The clothing industry in these advanced industrial nations consequently found itself pushed into a phase of drastic and often painful restructuring. Key strategies in this restructuring process have been cost reduction (which in the labour-intensive clothing industry means cutting the cost of labour) and product differentiation, some companies having sought to survive by specialising in 'naturally protected' areas of the market (those characterised by the sale of higher quality products with short lead times and production runs). Utilising such strategies, the clothing industries of the advanced industrial nations have enjoyed a partial recovery, apparently having found a role for themselves in this new industrial order.

The extent to which these responses to third world competition, which have been widely documented elsewhere (Rainnie 1984; Mitter 1986; Hoffman and Rush 1988), have been paralleled in

Table 1: EMPLOYMENT IN THE CLOTHING INDUSTRY, 1971-88

Year	Number of workers (000)	Females as a % of total workforce	Clothing employment as a % of total manufacturing employment
1971.....	99.8	52.8	7.3
1972.....	97.8	51.5	7.3
1973.....	96.2	79.3	7.0
1974.....	97.7	80.0	7.1
1975.....	83.0	76.3	6.6
1976.....	76.7	78.0	6.0
1977.....	78.5	78.0	6.0
1978.....	73.3	81.4	6.1
1979.....	74.4	77.4	6.1
1980.....	74.2	78.2	6.0
1981.....	72.1	76.0	5.8
1982.....	69.2	76.6	5.8
1983.....	70.9	77.4	6.3
1984.....	70.9	81.1	6.2
1985.....	70.5	79.4	6.3
1986.....	73.2	77.0	6.2
1987.....	72.9	76.7	6.3
1988.....	75.2	76.3	6.3

Source: ABS (1986a, 1988c)

Australia remains something of a moot point. While the extent of job loss over recent years reflects the pressures which have been brought to bear upon the industry, the precise form of restructuring remains unclear. It would be unwise to assume that Australia will automatically follow the same path as Britain and the United States in response to third world competition. There is a need to examine the specificities of the Australian situation if accurate predictions about the future directions of change are to be made.

Industry structure: labour, capital and technology

The clothing industry in Australia can be characterised by its very small average firm size, its technological backwardness and its poorly-paid, largely female workforce. The industry centres upon Melbourne and Sydney, which together account for in excess of two-thirds of the national workforce. These areas have borne the brunt of the job losses which have plagued the clothing industry since the mid 1970s. Table 1 describes the extent of job losses in the clothing industry over the 1971-1988 period², one in which a quarter of the workforce was lost. During this period, the clothing industry's share of total manufacturing employment also fell. The relative stability of employment in the industry since 1982 is partly attributable to the package of government assistance measures for the textiles, clothing and footwear (TCF) sector, launched in that year.

The capital structure of the clothing industry is a bimodal one, being divided between a large group of very small firms and a small cluster of large firms. As Table 2 shows, while almost three-quarters of the establishments in the clothing industry employ less than 20 workers, the small group of large establishments (those with 100 or more workers) employ 41 per cent of the industry's workforce and account for 43 per cent of its annual turnover. Workers in the large firm sector tend, on average, to be more highly-paid than their counterparts in the small firm sector, although still significantly less than the average for the manufacturing sector as a whole (ABS 1986b).

Small firms tend to occupy the most unstable areas of the market, surviving by virtue of their

ability to switch rapidly between product lines and their relatively low cost overheads. The low costs of entry which exist in the clothing industry contribute to the volatility of the small firm sector, as new entrants pose a constant competitive threat for 'established' small firms. The large firm sector, by contrast, occupies the more stable segments of the market, utilising (where possible) mass production techniques. There are, however, technical limits to the application of mass production systems within the clothing industry, the stability of firms in this area being more a reflection of their ability to dominate markets than of their possession of inherently superior technologies. Not only do large firms enjoy more favourable (and equitable) relationships with the industry's major customers in the retail trade, they have also been successful in exporting many of their business risks to the small firm sector through the evolution of a system of production subcontracting (TNC Workers Research 1985; Cummings 1986). Many small firms in the industry are consequently completely dependant upon subcontracted work, a situation typified by the 'maker up', a small firm which assembles garments on a contract basis for other companies.

The basic labour process in the clothing industry has changed little since the inter-war period, when the traditional method of production, that of 'making through' (in which a individual worker produced an entire garment) was superseded by a system based upon a detailed division of labour, each worker performing just one task within the overall assembly process. This process of deskilling and subdivision of work tasks was associated with the feminisation of the industry, as the male workers (who had generally performed the skilled task of 'making through') were replaced by groups of 'less skilled' female machinists, each working on a single, repetitive task (Coyle 1982; Frances 1988). Following this process of subdivision, employers achieved productivity gains through intensification and speeding up of the labour process, strategies linked to the development of piecework and bonus payment systems (Massey and Meegan 1982; Rush and Soete 1984; Cockburn 1985).

The clothing industry has remained a highly labour-intensive one. Although there have been some technical innovations (such as the introduc-

Table 2: THE STRUCTURE OF THE CLOTHING INDUSTRY, AUSTRALIA 1984-85

	Percentage distribution by establishment size						Total
	1-4	4-9	10-19	20-49	50-99	100+	
No. of establishments	23	29	21	16	6	5	20,013
Employment	2	7	12	19	19	41	49,711
Turnover (\$A million)	na	7	13	20	18	43	2,150
Value added (\$A million)	na	6	11	19	19	44	1,023
Wages and salaries (\$A million)	1	5	11	19	19	45	630

Source: ABS (1986b)

tion of specialised button-holing and zip-fitting machines), the entire production process continues to rely upon the individually-operated sewing machine (IAC 1980), and therefore upon the manual skills of its workforce. The lack of incentive in the clothing industry to invest in new technology could be explained by the availability of such a large pool of cheap labour (following Marx 1976: 516). Major technical problems, however, would have to be surmounted if the industry were to be further automated. The process of materials handling — which accounts for 80 per cent of the clothing production cycle — has proved virtually impossible to automate; the tactile and visual senses of the human operator simply cannot be replaced by machinery at this stage (Ruah and Soete 1984; Hoffman and Rush 1988).

The reliance on the sewing machine, therefore, remains. This not only accounts for the clothing sector's characteristic labour-intensiveness, it also accounts for the existence of distinctive possibilities for production process fragmentation — both vertically and horizontally — in the industry (Rubery and Wilkinson 1981). The fact that the sewing machine is small, relatively inexpensive, has low maintenance costs and can be operated by a single person means that the logical limits of the fragmentation process — production based upon a network of home-based outworkers — is realisable in the clothing industry.

There has been potentially significant technical change, however, in the pre-assembly stage of the clothing industry. Computer-aided design (CAD) technology was introduced in the 1970s, enabling the automation of the complex, and highly skilled, processes of garment design, pattern-making and cutting (Rush and Soete 1984). This was the last bastion of male-dominated, craft work in the clothing industry (Cockburn 1985; Frances 1986). Although CAD machinery does reduce pre-assembly labour costs, these only amount to a very small proportion of total costs. Rather than labour saving, the principal advantages of these new technologies lie in improved control over employees and materials and in heightened flexibility for the firm as a whole. CAD machinery allows rapid switching between production runs, a crucial development for those firms which have sought to 'trade up' into the high quality/high fashion end of the clothing market in response to import competition in the standardised goods sector (Truman and Keating 1988). Indeed, CAD machinery, in order to be utilised efficiently, must be employed on short production runs with constantly changing styles, where the functions of design, pattern-making and cutting are in greatest demand, and therefore account for a larger proportion of total production costs (Cockburn 1985).

It has been argued that investment in such technologies in the clothing industry will lead to improvements in employment conditions, as firms

will require a more stable and highly skilled workforce and will compete on the basis of superior design and technology, rather than on the basis of price (Zeitlin 1985; CLES 1986). The findings of Truman and Keating's (1988) study of the British clothing industry, however, led them to question this optimistic prediction. They found that workers in this 'advanced' sector had rarely been given the opportunity to learn new skills, many complaining that the computerised production schedules which had been introduced had, in fact, increased the pace and monotony of their jobs.

Resume

The Australian clothing trade continues to be characterised by small and technologically-backward firms and is therefore highly vulnerable in what has become a highly competitive, global industry. Some form of industry restructuring is without doubt overdue, a fact which has not gone unnoticed by the Hawke government, which has advocated trade liberalisation as the answer to the problems facing the clothing industry. As Senator John Button argued:

Industries which lose their dynamism inevitably become lethargic, slowly decline in all . . . aspects of competitiveness, until eventually they are eliminated by obsolescence or international competition, or both. Protective barriers may delay the demise of an industry but will not restore it to healthy growth (quoted in Hince 1987: 12)

The remainder of the paper documents the processes of adjustment which are currently at work in the industry and speculates on some of the future directions of change. Here, focus is laid upon: (i) changing product market conditions; (ii) industrial disintegration and the growth of outworking; and (iii) the role of labour market restructuring in the process of industry adjustment.

RESTRUCTURING IN PRODUCT MARKETS

The period since the mid 1970s has seen two fundamental changes in the nature of product markets in the Australian clothing industry. First, competition from third world exports has been stepped up considerably, a trend certain to be exacerbated by the trade liberalisation policies of the Hawke government. Second, the retail industry, the clothing industry's principal customer, has been substantially restructured, changed purchasing strategies having immediate and far-reaching effects on clothing manufacturers. These changes are discussed in detail below.

Trade liberalisation policies and industry adjustment

Over the last decade, the Australian clothing

industry has faced mounting problems in its domestic product markets, as low-cost imports have claimed a steadily increasing market share. It was estimated in the early 1980s that up to 40 per cent of clothing sales in Australia are of imports (Light 1982). This increased import penetration has been spearheaded by the rapidly-growing third world exporting countries. Third world competition has been most fierce at the discount end of the market (IAC 1980, 1986). It is this segment of the clothing market which is most suited to the mass production techniques upon which the dominance of the third world producers has been built (Froebel *et al.* 1980; Hoffman and Rush 1988). Without doubt, the impact of import competition has been tempered by the federal government's reluctance to completely abandon its protectionist policies. As Figure 1 shows, however, the level of imports has been rising steadily throughout the 1980s; it is certain to rise further following the cuts in tariff and quota protection under the post-1988 assistance arrangements. In contrast, the export capacity of the clothing industry is very low indeed.

Significant elements of the domestic clothing industry have been undermined by cheap imported goods. Although definitional changes make time series comparisons difficult, clothing industry production monitors clearly show that some product areas have been devastated by these developments. Domestic production of men's jeans, for example, fell by 51 per cent between 1975-76 and 1987-88 (ABS 1978, 1988e), resulting in numerous plant closures (see Krieger and Sloan 1986). Correspondingly, Konstantinidis (1987a) reports that a number of clothing firms have sought to move away from the discount market, having changed their product mix in recent years in favour of more

lucrative areas, such as fashion outerwear. Whether or not these changes are indicative of a fundamental restructuring of the industry, however, remains to be seen.

The vulnerability of the industry to import competition was initially revealed in the mid 1970s. During this period, a sharp increase in import competition coincided with reductions in tariff protection, currency revaluations and domestic wage increases, costing the industry 21,000 jobs between 1974 and 1976 (Table 1). In response, the federal government introduced a package of protectionist measures. In 1981/82, the effective rate of protection for the clothing and footwear industry was 204 per cent, compared with just 26 per cent for the manufacturing sector as a whole (Konstantinidis 1987b). This protectionist stance was reviewed in the early 1980s and in 1982 a seven-year plan was introduced with a view to gradually opening up the Australian TCF industries to import competition. Following several years of steadily increasing trade exposure, but very little sign of increased capital investment, a new plan to revitalise the TCF industries was launched by the federal government in 1986.

The new plan for the restructuring of the TCF industries, which came into force in 1989, places greater emphasis on improvements in efficiency and seeks to encourage specialisation in niches of the domestic market (such as high quality/high fashion goods) less prone to import substitution (IAC 1986). It is widely acknowledged that this reduction in industry assistance will result in substantial job losses in the TCF industries. Estimates of the extent of job losses vary, however, from the Industries Assistance Commission's figure of 20,000 to the Textiles, Clothing and Footwear Development Council's figure of 50,000 (CATU 1986a). Under the terms of these new industry assistance arrangements, all quota assistance for the clothing industry will be removed by 1996 and tariff barriers at the lower level of 60 per cent (less 5 per cent for imports from developing countries) will be introduced (Konstantinidis 1987b). In addition, there will be a shift towards a free trade arrangement with New Zealand, within the provisions of the Closer Economic Relations Agreement. In order to expedite the restructuring process, the government's proposals include a \$A200 million Industrial Development Strategy, to be implemented by a new body, the Textiles, Clothing and Footwear Development Authority. The Industrial Development Strategy contains: incentives for increased processing of raw materials; the promotion of greater efficiency within existing TCF firms; innovations in infrastructure support for the industries; and assistance for export development (TCFDA *undated*).

A more 'hands on' approach from the federal government may be required, however, if the clothing industry is to be restructured effectively. So

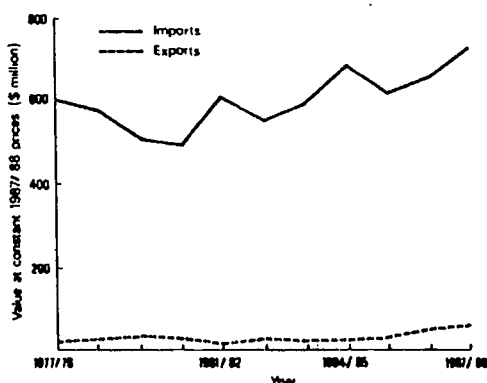


Figure 1: Value of imports and exports of clothing, clothing accessories and articles of knitted or crocheted fabric, Australia 1977/78 to 1987/88.

Source: ABS Exports, Australia: annual summary tables, Catalogue No. 5424.0, ABS, Canberra; ABS Imports, Australia: annual summary tables, Catalogue No. 4528.0, ABS, Canberra.

far, there have been few signs of positive change. A sharp fall in output levels was halted in 1983/84, but since then the industry has shown no signs of growth (BIE 1988a). At the 1988 Manufacturing Outlook Conference, it was acknowledged that the TCF industries continued to face major problems. The expectation was that the clothing industry would concentrate its efforts on the higher quality, branded merchandise segment of the market, while the discount market would be sourced largely from overseas (BIE 1988b). Should this prediction prove to be accurate, the industry would be following a path similar to that witnessed in other advanced industrial countries. In Europe, for example, the clothing industry has enjoyed something of a resurgence, having capitalised upon its capacity to service, with the necessary speed and flexibility, the fashion end of the market (Euromonitor 1985; Mitter 1986). In order to serve this segment of the market, in which design changes are rapid and production runs invariably short, many European firms have invested heavily in CAD technology (Hoffman and Rush 1988). This renaissance in the European clothing industry, epitomised by the spectacular success of Benetton (Withers and Fawcett 1984), has its roots in the notion of 'flexibility'.

The 'Benettonisation' of parts of the clothing industry in Europe and North America has had profound implications for capital structure, inter-firm relationships and labour utilisation. For the new 'flexible firms' in the clothing sector, the hoarding of labour on the factory floor is highly inefficient. Mitter (1986: 47) explains:

Outside sourcing, whenever it is possible to do so, makes sensible management practice, especially for the labour intensive assembly side of the operation. The quality and brand image, if and when it is necessary, can be maintained by adequate supervision of the pre-assembly and finishing stages of production on the main factory floor. The roles of the sweatshop economy, of artisan firms and homeworking become crucial in this scheme of subcontracting by domestic manufacturers, where access to a captive and disposable workforce becomes an essential strategy for reducing the unnecessary overhead costs.

The Benetton model consequently does not provide an answer to the problems facing the clothing industry as a whole. Rather, it represents a strategy open to only a small number of firms — those with access to the significant capital resources required for the initial investment in new technology — a strategy based fundamentally on: (i) the exportation of risk to the periphery of the industry through the mechanism of production subcontracting; and (ii) the 'super-exploitation' of labour within this periphery through such 'arms-length' subcontracting transactions. Such a form of flexible specialisation would seem unlikely to

lead to the resurgence of the small firm, as envisaged by Piore and Sabel (1984). On the contrary, an increasing concentration of economic power would seem to be a more likely trend, as large firms capitalise upon their access to sources of investment (Rush and Soete 1984; CLES 1986; Pollert 1988). Such a trend is indeed already apparent in a number of advanced industrialised nations (OECD 1983; Hoffman and Rush 1988).

Concentration in the retail industry

The Australian retail sector has also had a powerful effect on the restructuring of the clothing industry. The rapid growth in consumer spending in the 1950s and 1960s was the driving force behind a dramatic reorganisation of the retail industry, this being the period in which the large retailers (such as Coles, Myers and David Jones) broke out of their relatively limited regional markets and began to build up interstate chains. An equally significant development was the emergence, in the late 1960s and early 1970s, of the discount department stores (for example, K-Mart, Target and Big W). As Rosewarne (1983) explains, however, the 1970s brought considerable problems for the retail sector: the consumer boom began to slow, leaving the large retailers with over-capacity and falling profitability. In the struggle to maintain market shares, the large retailers embarked upon a series of takeovers (producing even higher levels of industry concentration) and a number of price wars were to break out, led by the discount stores (which were to further erode industry profitability and drive out many of the remaining small retailers).

In this increasingly centralised retail system, the large chains enjoy an ever-growing monopoly over the sale of consumer goods (Riera 1988; *The Age* 1989). The Coles Myer group accounts for more than one-fifth of all retail sales in Australia, with Woolworths accounting for a further 10 per cent (*Australian Financial Review* 1988b; Shoebridge 1988). As a result, these firms have accrued enormous bargaining power in their dealings with clothing manufacturers (Rosewarne 1983; TNC Workers Research 1985), a trend also observed in Britain (Rainnie 1984; Gibbs 1988). The large retailers (sometimes, it has been said, even acting in collusion) are able to dictate prices and supply conditions from clothing manufacturers who in comparison are in a very weak bargaining position (Rosewarne 1984). One example of the power of the retail chains has been their ability to persuade manufacturers to shift away from the use of trade labels in favour of 'house brand' names. More recently, the major retailers have berated clothing manufacturers for their poor quality control, threatening to turn to imported goods if the situation does not improve (*Australian Financial Review* 1988a, 1988c).

A major part of the clothing industry has conse-

quently found itself virtually enslaved by the retail sector. Many clothing firms can now be said to have lost control over the pricing, product composition and scheduling of their own output. The powerful retail buyers have been able: (i) to hold down wholesale prices (thereby reducing profit margins in the clothing industry where labour and other costs have been rising); and (ii) to insist that clothing manufacturers work 'closer to the market', with shorter lead times and production runs. Faced with such uncertainty, it is not surprising that the majority of clothing firms have continued to eschew the possibility of investment in new technology (see Konstantinidis 1987a; Hoffman and Rush 1988). They have, instead, taken a different route: the necessary cost savings and improvements in flexibility have been achieved, as the following section shows, through increased out-sourcing and accelerated labour exploitation.

INDUSTRIAL DIS-INTEGRATION AND THE GROWTH OF OUTWORKING

Clothing manufacturers have sought to externalise some of the risks associated with their precarious economic position through the mechanisms of production subcontracting and, more commonly, outworking. In this way, many of the burdens of cost and risk are passed on to those with the least bargaining power (Cummings 1986; Shutt and Whittington 1987). As a recent survey has demonstrated, the use of subcontractors is widespread in the clothing industry (DEIR 1986). Here, four out of every ten firms reported that they were utilising subcontractors, the level of usage having risen substantially in the 1980s. Amongst this group of firms which had engaged subcontractors, 49 per cent of output was undertaken off-site in 1984/85, compared to a figure of 37 per cent in 1981/82.

Although quantification is very difficult, industrial outworking would appear to be a rapidly growing employment form in the Australian clothing industry, a trend which has received widespread attention, and caused equally widespread concern, in recent years (*TransNational Brief* 1980b; Illawarra Migrant Resource Centre 1984; TNC Workers Research 1985; Centre for Working Women Co-operative 1986; Cummings 1986; CATU 1987; NSW, DIRE 1987; Scott 1987; O'Donnell 1987; Walker 1989a, 1989b; Alcorso 1989). This highly exploitative form of employment, thought to have been virtually eradicated in Australia over 100 years ago (Lynzaat 1979), is characterised by its low pay, poor working conditions, lack of legal rights and entitlements, irregularity of work and poor health and safety record. The Clothing Makers' Association of New South Wales has estimated that there could be as many as 60,000 outworkers in New South Wales and Victoria (quoted in Cum-

mings 1986), a figure which if correct would almost double the known size of the clothing industry.

The most common forms of outworking in the clothing industry are those in which a worker is engaged, either directly by a manufacturer or by an intermediary (the 'middleman'), to carry out work in her/his own home on a payment-for-work-completed or piece-rate basis. The payment system is crucial, for this is one of the means by which this decentralised production process is controlled, its 'disciplining' influences replacing the process of direct supervision on the factory floor. Outworking provides numerous cost-saving advantages for the clothing manufacturer (see Lip-sig-Mumme 1983; Allen and Wolkowitz 1987). These are summarised below under three headings: labour costs; overhead costs; and other management costs.

Any means of reducing *labour costs* will be of interest to employers in an industry where they constitute such a large proportion of total production costs. Outworking allows employers to purchase labour in discrete and variable amounts, paying only for actual output (Rubery and Wilkinson 1981). Outworkers, in addition to being paid only for work completed, will often receive no paid holidays, overtime pay, sickness payments or redundancy compensation. Pay rates for outworkers are without doubt also very low (see Hakim and Dennia 1982; Centre for Working Women Co-operative 1986; Mitter 1986), often falling significantly below the Award Rate for the industry (CATU 1987).

Outworking allows the manufacturer to pass on *overhead costs* (such as rent, heating and lighting, insurance and maintenance) to the outworkers themselves. Employers also avoid the 'costs' of health and safety provision. Consequently, accidents and health problems, such as repetitive strain injuries and respiratory complaints caused by cotton dust, are commonplace (TNC Workers Research 1985; Centre for Working Women Co-operative 1986).

Amongst *other management costs*, outworking reduces, for manufacturers, labour management costs because the organisation of the outwork system (including responsibility for making payments and for the delivery and pick-up of garments) is typically undertaken by a middleman (Centre for Working Women Co-operative 1986). Middlemen are often members of the same migrant communities as the outworkers themselves. Outworkers in such cases are typically recruited from the networks of family and friends of the middlemen, who, due to their 'non-economic' bonds are less likely to revolt against their poor pay and conditions (Hoel 1982). The costs of recruitment, training and quality control are also devolved to middlemen and to the outworkers themselves. Many outworkers are actively involved in the recruitment and induction of other outworkers, who

are generally expected, as women, to be in possession of the necessary skills (Allen and Volkowitz 1987). It is consequently left to the outworkers themselves to build up the speed and accuracy of their work — and with it their earnings. If the work fails to meet quality standards, no payment will be made. In order to receive payment, therefore, the outworkers must perform their own quality control, which may mean correcting mistakes made earlier in the assembly of the garment.

Outworking would consequently seem to provide clothing manufacturers with an effective mechanism for reducing production costs. A recent Arbitration Commission ruling, that outworkers in the clothing industry should receive payments and benefits not dissimilar to those of regular employees, while it has served to regulate part of the outwork system, is widely recognised to be no more than a small step towards the eradication of home-based labour exploitation (*Australian Financial Review* 1987; Scott 1987)⁴. The unregulated outworking sector certainly remains large — many would say in fact dwarfing the regulated sector — and may even be growing as firms come under increasing pressure to reduce costs (Cummings 1986). In contrast, there is little evidence that Australian clothing manufacturers are responding to pressures for restructuring by investing in new plant and machinery along the lines of the Benetton model.

The low-technology character of the Australian clothing industry is confirmed in Figure 2. Here, an

index of net capital stock (representing investment in new plant and machinery) is compared with indices of worker productivity (value of output per worker and value added per worker). As Figure 2 shows, investment in the industry has been falling consistently since 1973/74, recovering only slightly in the post 1982/83 period. In contrast, the indices of productivity describe a generally rising trend since the mid 1970s, contrary perhaps to expectations, given falling investment levels. Without doubt, this productivity increase is partly due to the successive waves of retrenchments and plant closures which have swept through the clothing trade, taking with them many of the least productive segments of the industry. Alone, however, this explanation is inadequate.

Faced with similar evidence, both Mitter (1986) and Scott (1987) concluded that rising productivity was being achieved through the growth of outwork and other forms of subcontracting to the 'informal economy'. This would serve to 'artificially' raise the level of productivity in two ways: (i) the unregulated sector typically exhibits higher productivity than the 'formal' factory sector; and (ii) most of the workers in the informal economy are excluded from the clothing industry's official employment counts, upon which productivity rates are calculated. As Tait and Gibson (1987) have also remarked, this explanation of the relationship between investment and productivity exhibited in Figure 2 is more plausible than the argument that higher productivity could have been achieved through inten-

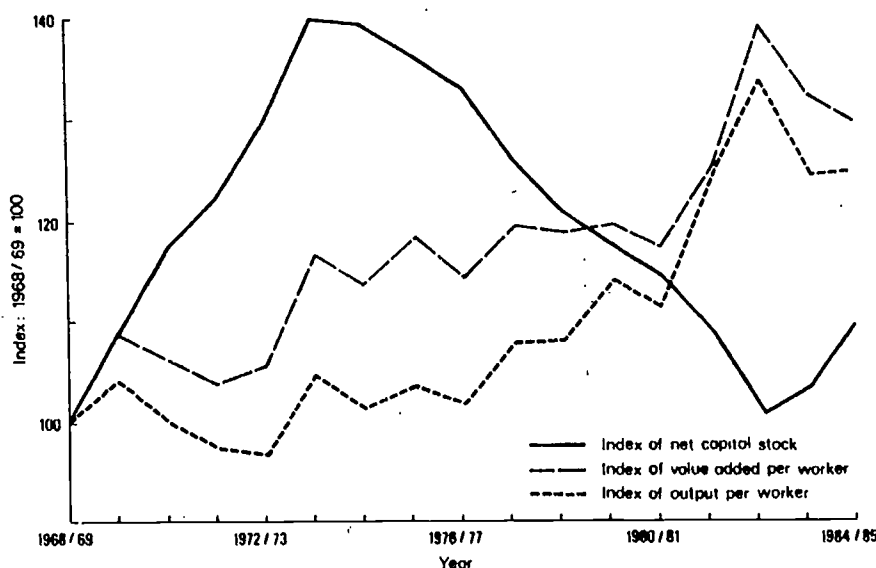


Figure 2: Net capital stock and worker productivity in the clothing industry, Australia 1968/69 to 1984/85.

Source: ABS Manufacturing establishments: selected items of data classified by industry and employment size, Australia, Catalogue No. 8201.0, ABS, Canberra.

sification within the factory labour process. Although significant productivity gains through intensification have been achieved in the past, since the mid 1970s there has been relatively little scope for further improvements, at least in the absence of technical change (Mitter 1986). Over the last decade, the technical configuration of the production process in the clothing industry has been virtually 'frozen' (Rainnie 1984; Lipsig-Mumme 1987; Park 1988).

From the evidence in Figure 2, it would seem unlikely that Australia will spawn a 'high-tech' clothing industry, if left to its own devices in times of rising competition and tightening profit margins. Far from seizing the opportunity to enter a new technological paradigm, the industry, with but a few exceptions, has instead adopted an essentially 'retrograde' strategy in the face of import competition and has retreated further into the sweatshop economy. This is perhaps not surprising. The domestic market for garments in Australia is very small by world standards; the high quality/high fashion segment of this market being smaller still. It is simply not feasible for Australian clothing manufacturers to specialise in such a small-volume market. In contrast, those European firms which have followed the Benetton path into this segment of the market have done so in the context of relatively high volume sales, both domestically and in export markets. Their position as fashion leaders is important here, particularly in terms of the development of export markets, one which Australia — traditionally a follower of European fashions — would find it difficult to emulate.

RESTRUCTURING IN LABOUR MARKETS

The Australian clothing industry draws primarily on the large urban labour markets of Melbourne and Sydney, a fact which has itself proved significant in the process of restructuring. The low pay, poor working conditions and chronic employment instability which characterise the clothing industry

have been reflected in the labour market problems of high labour turnover and skill shortage. These problems have been tempered in the past, as the industry has traditionally dominated its segment of the labour market. The industry's urban labour supply is comprised largely of first-generation immigrant women (DEIR 1985; Tait and Gibson 1987), a group with few alternative sources of employment.

The problems of labour turnover and skill shortage in the clothing industry have intensified in recent years, as alternative sources of employment have been made available. The growth of the service sector, in particular, has been a key factor in the draining off of labour from the clothing industry. Between August 1978 and August 1988, in excess of 10,000 net new jobs per month were created in the service sector, most of which were filled by women (ABS 1988a, 1988b). Not only did these service sector jobs typically offer women better working conditions, higher job status and greater employment stability, they also tended to be better paid. Wages in the clothing industry have always been low, but recent years have seen the industry slide further down the wages league. In 1973, the average weekly earnings of full-time female workers in the TCF industries (excluding managerial staff) were only 81.6 per cent of the average female wage across all industries, but by 1987, this figure had fallen to 75.4 per cent (ABS 1988a, 1988c). Given that clothing workers earn less than the TCF average and that there exists in the trade a sizable (and growing) informal sector of outworkers and casual labourers, these figures almost certainly understate the extent of the problem of low pay in the industry.

These labour market pressures on the clothing industry, it must be emphasised, are largely urban problems. The service sector boom and the intensification of inter-sectoral wage competition in the labour market are both basically urban phenomena. Compounding these problems, the process of gentrification has served to break up and displace the working-class labour pools of the inner suburbs, upon which the clothing industry had come to

Table 3: THE SPATIAL DISTRIBUTION OF EMPLOYMENT IN THE CLOTHING AND FOOTWEAR INDUSTRY, 1971-86

	Share of total employment				Absolute employment change 1971-86 (%)
	1971	1976	1981	1986	
Melbourne	48.0	45.0	45.6	43.5	-33.5
Rest of Victoria	5.7	8.6	8.9	9.5	+16.4
Sydney	29.0	27.1	25.7	24.4	-40.9
Rest of New South Wales	6.9	6.1	6.4	8.4	-35.4
Other state capitals	11.1	11.8	11.6	13.0	-16.5
Other non-metropolitan	1.3	1.8	1.9	3.2	+89.6
All capital cities	86.2	83.8	82.9	81.1	-33.8
All non-metropolitan	13.8	16.2	17.1	18.9	-3.8
Australia	100.0	100.0	100.0	100.0	-29.7

Source: ABS Census of Population and Housing, 1971, 1978, 1981, 1986, ABS, Canberra.

rely (see Logan 1985; Maher 1988). As Table 3 shows, using data for the period 1971 to 1986, a yet more distinctive geography of clothing industry employment has emerged over what has for Australia as a whole been a period of sharp decline. It is urban areas, although they still dominate the clothing industry, which have experienced the most serious employment losses, while non-metropolitan employment accounts for an increasingly large proportion of the total. This increase in the relative importance of non-metropolitan employment in the clothing industry can be seen, in part,

as a response to urban labour market problems, the proportionate shift away from the cities having allowed the industry to tap into a qualitatively different labour supply. Non-metropolitan Victoria has been one of the areas to experience actual job growth over the 1971-1986 period, a time in which many of the larger clothing manufacturers began to locate plants in the country towns⁶.

This tendency for a relative decentralisation of clothing employment is equally pronounced at the intraurban level. A comparison of the spatial distri-

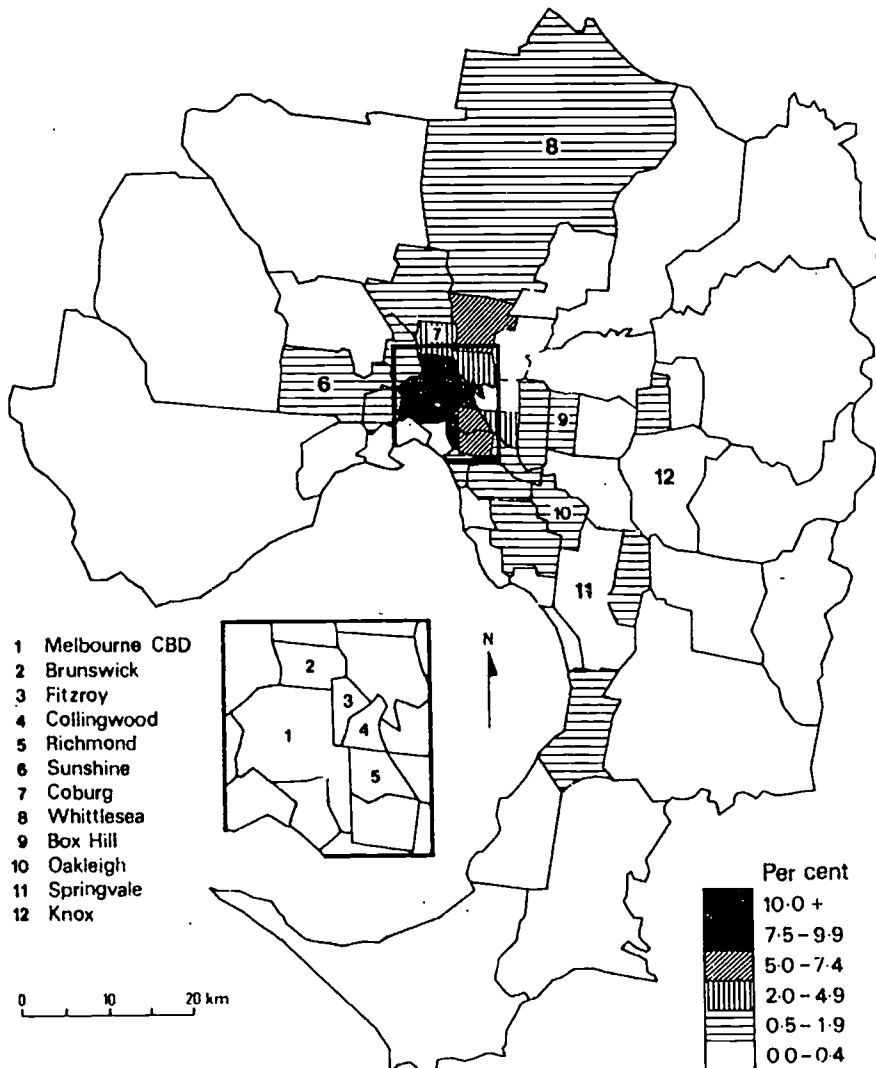


Figure 3: Spatial distribution of clothing and footwear industry employment, Melbourne 1969/70.
Source: ABS Manufacturing establishments: small area statistics, Victoria, ABS, Canberra.

bution of clothing and footwear employment within the Melbourne Statistical Division for the years 1969/70 (Figure 3) and 1984/85 (Figure 4) reveals that a dispersal of clothing employment from the inner to the outer suburbs has been underway for some time. The Melbourne CBD and inner suburbs have been losing employment at a rapid rate, a fact which Rimmer (1969) highlighted in his 1966 study, while outer suburbs such as Sunshine, Coburg and Springvale have begun to play an increasingly important role in the clothing industry. During this 15-year period, the number of clothing

establishments in the CBD and inner suburbs was more than halved, falling from 1,123 to just 500 (ABS 1986c). In the context of a generally contracting clothing industry, the number of establishments in the outer suburbs also fell, but at a much slower rate (from 449 to 369). The pattern of change in terms of absolute numbers employed is shown in Figure 5. Here, although the relative shift in employment to the outer suburbs is quite apparent, it is clear that the employment growth in these areas is only modest in comparison with the spectacular decline of the inner area.

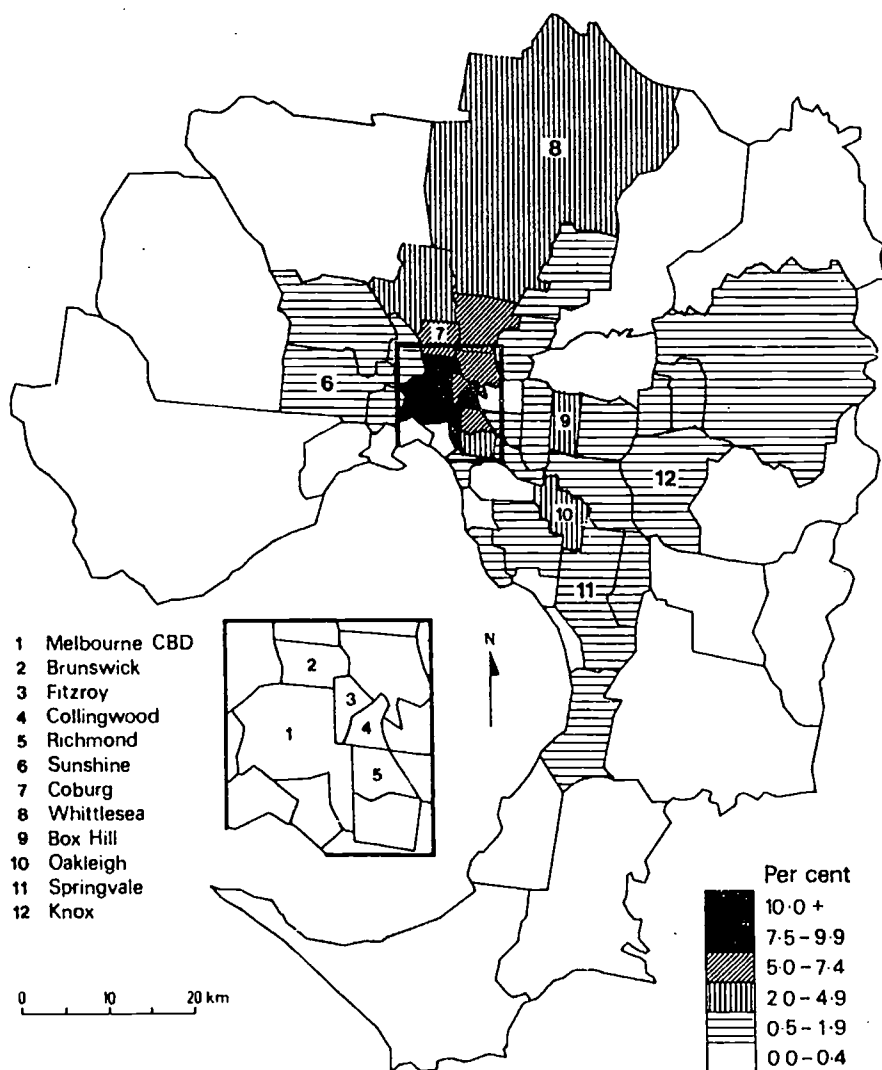


Figure 4: Spatial distribution of clothing and footwear industry employment, Melbourne 1984/85.
Source: ABS Manufacturing establishments: small area statistics, Victoria, ABS, Canberra.

Large firm strategies and the spatial division of labour

The differences between the metropolitan and the non-metropolitan workforces of the clothing industry have been highlighted in a number of recent studies (IAC 1980; DEIR 1985; Sloan *et al.* 1985; BLMR 1987). Women dominate the industry's labour force in both metropolitan and non-metropolitan areas, but non-metropolitan areas exhibit the following distinguishing features: (i) a significantly lower proportion of immigrant workers

— less than one quarter of non-metropolitan clothing workers are immigrants, compared with 62 per cent of the metropolitan workforce; (ii) a younger age structure — 42 per cent of non-metropolitan clothing workers are aged below 26, compared with 25 per cent in the cities; (iii) a larger proportion of unmarried females, a fact related to the younger age structure of the industry in these areas; and (iv) an under-representation of managerial and administrative workers and an over-representation of machinists and labourers, relative to the cities, as Table 4 shows.

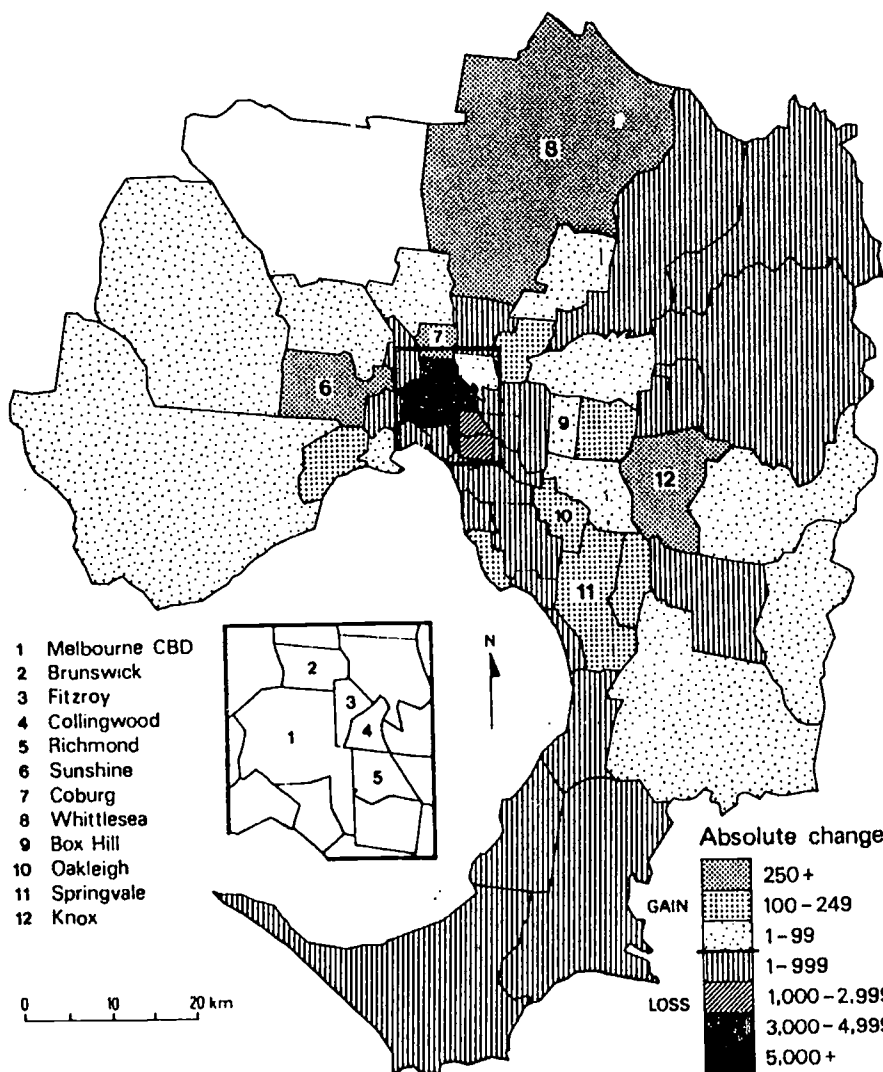


Figure 5: Absolute employment change in the clothing and footwear industry, Melbourne 1969/70 to 1984/85.

Source: ABS Manufacturing establishments: small area statistics, Victoria, ABS, Canberra.

Recent studies of the clothing industry (Sloan *et al.* 1985; Konstantinidis 1987a) have highlighted the importance of labour availability in the locational choices of firms. Shortages of labour (particularly of skilled sewing machinists) and industrial relations problems in urban labour markets have prompted a number of the larger clothing firms to relocate part or all of their production activity to non-metropolitan areas'. In response to these problems, some multiplant firms had evolved quite elaborate spatial divisions of labour. Here, it is common for overall managerial control and the more capital-intensive functions (design, pattern-making, cutting, marketing and distribution) to be retained in Melbourne and Sydney, while the more labour-intensive production functions were decentralised (see Sloan *et al.* 1985). As Table 4 showed, this spatial division of labour is reflected in the differing occupational structures exhibited by the clothing industry in metropolitan as opposed to non-metropolitan locations.

The advantages for clothing firms of non-metropolitan locations lie in their relationships with the local labour market. By locating in areas with few alternative sources of female employment, they are able to monopolise a segment of the labour supply, thereby avoiding many of the urban labour market problems of labour turnover and wage competition. Moreover, firms can be confident, should they need to lay off labour during slack periods, that many of the same workers will be available for subsequent re-engagement. While there is a certain amount of labour mobility in non-metropolitan areas (Sloan *et al.* 1985), this is not sufficient to cause major problems for the clothing employers. Generally speaking, the non-metropolitan workforce is stable, a fact reflected in the narrow industrial bases and in the high levels of demand deficiency-induced unemployment (particularly among females) in these areas (Lawrence 1982).

Small firm strategies and the rise of outworking

The option of relocating part or all of the production process is not, of course, open to all clothing firms. Paralleling developments in Britain (Massey 1984), it has generally been the larger

firms in the industry which have been most successful in escaping the labour problems of the cities, while the overwhelming majority of small firms have remained 'trapped' in the inner city (see IAC 1980; Sloan *et al.* 1985; Konstantinidis 1987a). The response of these 'immobile' small firms, forced to find an *in situ* response to their urban labour problems, has been to deepen their penetration of the most marginal segments of the urban labour market. The most significant increases in outworking and in part-time and casual work have occurred in these small, metropolitan-based companies (DEIR 1955). This association between small firms and the use of outworkers does not, of course, absolve large firms from this form of labour exploitation. On the contrary, large firms, through their attempts to reduce costs and enhance flexibility by way of out-sourcing, are instrumental in the creation of an environment in which outworking can flourish. Large firms, as Scott (1987) has emphasised, are deeply implicated in the growth of the outwork system, because, while they may not often employ outworkers directly, the increasingly widespread use of production subcontracting often leaves small subcontractors in a situation where they must use outworkers in order to break even. Outworkers and the small firms which typically engage them are situated at the bottom of a complex production chain which is dominated by the large firms, and ultimately, the powerful retailers (see TNC Workers Research 1985). Consequently, this should not be seen as a case in which small firms 'choose' to use outworkers whereas large firms do not. Rather, the difference is between the small firms who use outworkers directly and the large firms who utilise this system at 'arms-length', via subcontracting relationships.

'Non-standard' employment forms, especially outworking, have been used as mechanisms for opening up new pools of cheap and pliant labour within the urban labour market itself. The industry continues, therefore, to 'plunder' the human resources of the labour market (see Peck 1989). The industry's search for new sources of cheap labour has led it to increase its level of reliance

Table 4: OCCUPATIONAL STRUCTURE OF THE CLOTHING AND FOOTWEAR INDUSTRY, VICTORIA AND NEW SOUTH WALES 1986

	Share of workforce (%)		
	Capital cities	Non-metropolitan areas	Total
Management, administration and professionals	11.7	5.8	10.6
Clerks and salespersons	9.2	6.1	8.6
Tradespersons	13.4	8.9	12.5
Plant/machine operators and labourers	65.7	79.1	68.2
All occupations	100.0	100.0	100.0
(Number)	(46,246)	(10,811)	(57,057)

Source: ABS Census of Population and Housing, 1986, ABS, Canberra.

Table 5: PROPORTION OF THE CLOTHING AND FOOTWEAR INDUSTRY WORKFORCE BORN OVERSEAS, 1971-86

	Share of workforce born outside Australia (%)			
	1971	1976	1981	1986
Melbourne.....	63.4	66.1	67.3	67.0
Rest Victoria.....	20.0	21.8	20.7	18.6
Sydney.....	50.8	56.4	59.5	65.9
Rest New South Wales.....	21.8	26.4	28.2	29.6
All capital cities.....	55.6	59.5	61.1	61.9
All non-metropolitan.....	20.6	23.0	23.0	23.5
Australia.....	50.8	53.6	54.6	54.6

Source: ABS *Census of Population and Housing*, 1971, 1976, 1981, 1986, ABS, Canberra.

upon the most disadvantaged and isolated (in labour market terms) of urban workers — first-generation immigrant women. As Table 5 shows, immigrant labour forms an increasingly large proportion of the clothing industry labour force, a trend most marked in metropolitan areas⁶.

The urbanised segment of the clothing industry is one of the most important 'sites of incorporation' of immigrant women workers (Tait and Gibson 1987; Campbell *et al.* 1989). This group of workers has very limited access to the 'mainstream' of the labour market, often having childcare responsibilities and poor English language skills (CATU 1980; *TransNational Brief* 1980a; DEIR 1985; VEAC 1985; NSW. DIRE; Scott 1987; O'Donnell 1988; Alcorao 1989), and as a result is virtually confined to the 'hidden labour market' of the outwork system (*TransNational Brief* 1980b; TNC Workers Research 1985; Centre for Working Women Co-operative 1986; CATU 1987). Paralleling experiences in Canada (Lipsig-Mumme 1987), the strategy of outworking has been used by clothing manufacturers as a means of engaging within the production process the immigrant 'underclass' of the inner cities.

Outworking appears therefore to be largely, although not exclusively, an urban phenomenon, a response to the urban labour market problems of high labour turnover, wage competition and skill shortage, as well as to the imperatives to drive down production costs and enhance flexibility. The extent of employment loss in the cities described by official statistics may, as a result, have been somewhat overstated. The last decade has been a period in which the clothing industry has repositioned itself within the urban labour market, moving more deeply into the 'hidden labour market' through the strategy of outworking. This, Tait and Gibson (1987) have asserted, has brought about a suburbanisation of clothing production and employment. Outworking allows clothing firms to remain in their inner city locations, and therefore close to their major clients (Konstantinidis 1987a), while tapping into the largely unused female labour resources of the suburbs (Scott 1987).

Resume: the clothing industry in its labour market context

The clothing industry draws upon a segment of the female labour supply in urban labour markets which is quite different to that utilised in non-metropolitan areas. In essence, the industry has been displaced to the very margins of the labour market in urban areas in response to pressures transmitted through product markets (to cheapen the costs of production and improve flexibility) and through the labour market itself (to avoid competing sources of labour demand in the external labour market). In contrast, the industry can still dominate the female labour market in non-metropolitan areas. In both situations, however, clothing workers face similar problems, lacking alternative employment opportunities. In urban areas, this lack of opportunity can be seen to stem from the 'supply-side' of the labour market in the sense that immigrant women with poor English language skills, childcare responsibilities and with little experience of industrial work (other than outworking) will have highly restricted mobility, even within relatively buoyant urban labour markets. In non-metropolitan areas, the problem is more of a 'demand-side' one, being largely due to the small size and narrowness of the industrial base in many country towns.

These regional differences in the clothing industry's use of labour are likely to have important implications for the process of restructuring in the 1990s. The Industries Assistance Commission, while acknowledging that further large-scale job losses are inevitable as trade restrictions are gradually lifted over the 1989-1996 period, has maintained that the process of labour adjustment need not be a traumatic one, as clothing workers will be able to find jobs in expanding areas of the economy (IAC 1986). This, to say the least, is a most optimistic scenario (CATU 1986b). For the reasons cited above, workers made redundant from the clothing industry, in both metropolitan and non-metropolitan labour markets, will without doubt face severe problems in their search for work (see also CATU 1980; TAIAC 1980). This may not, however, result in a large registered unemployment

ment effect, because many women cast out of the clothing industry will be reabsorbed into the household economy. The attendant economic hardships will thus remain hidden from the official statistics and as a result are unlikely to even register upon the national political agenda. The bulk of the costs of further restructuring, then, will be borne by the clothing industry's workforce, by one of the most vulnerable segments of the Australian labour market.

CONCLUSIONS

The Australian clothing industry, following the reduction trade protection in March 1989, is on the brink of a far-reaching phase of restructuring. This paper, while exploratory in nature, has nevertheless identified what are likely to be important currents of change in this restructuring process. Contrary to its widespread advocacy (IAC 1986; Konstantinidis 1987b; BIE 1988b), it would seem improbable that the industry will follow the Benetton path of flexible specialisation in the high quality/high fashion sector of the market, due to the very small size of this market and its limited export potential, a fact which is in turn linked to the industry's international reputation as a fashion follower rather than a leader. So, while flexible specialisation may be the answer to the problems facing a handful of firms, it is no panacea for the industry as a whole. For the majority of clothing manufacturers, the pressure will be for straightforward reductions in production costs, and therefore labour costs. Current indications are that this will lead to further growth in the 'unregulated' segment of the industry, as the necessary flexibility and cost savings will be achieved by the mechanisms of subcontracting and outworking. The impacts of such a 'market-led' restructuring process for the industry's workforce are likely to be both direct and deleterious.

Changes in product and labour markets have provided the impetus for recent changes in the structure of the clothing industry. Import competition, the concentration of buying power in the retail sector and urban labour market problems have brought about major changes in the structure of the industry, of which the growth of outworking and the increased use of non-metropolitan labour within an integrated spatial division of labour have been two of the most notable features. While the labour process has been one of the key arenas of change, it has not been the source of this change. This is to say, the recent restructuring of the clothing industry cannot be understood as a product of the 'internal logic' of the labour process (for example, as a response to labour control problems or the adoption of radically transformed production technologies), but should be explained in

terms of the pressures for change which have been building up in product and labour markets, pressures which have subsequently become manifest in the (re)organisation of the labour process. The case of the Australian clothing industry consequently highlights some of the ways in which the process of industrial restructuring is articulated throughout the entire circuit of industrial capital.

NOTES

1. I am grateful to Bob Fagan for making this point.
2. The 1988 figures may in fact overstate the level of employment in the clothing industry, which the most recent Census of Manufacturing (for 1986/87) records at less than 50,000 (ABS 1988d).
3. See note 2.
4. In this sense, 'skill' is not taken to refer solely to manual and mental capabilities, but also to comprise ideological meanings. 'Deskilling' therefore does not simply refer to the loss of technical skills, but also to important changes in job/worker status, task autonomy, remuneration levels, etc. (see Coyle 1982; Frances 1986).
5. Scott (1987) provides useful analyses of trade union responses to outworking and of the difficulties in policing a regulated outwork system.
6. Key plants located in non-metropolitan Victoria include: Yakka at Shepparton; Country Road at Camperdown; CHL Apparel at Churchill; Sportscraft at Morwell; Lee at Albury-Wodonga. (See also Sloan *et al.* 1985.) Between 1969/70 and 1984/85, the number of clothing establishments in non-metropolitan Victoria rose from 62 to 86 (a growth rate of 39 per cent), a fact which is all the more surprising in a period when the industry as a whole in Victoria was experiencing a sharp contraction. During this same 15-year period, the traditional heart of the clothing industry, the Melbourne Statistical Division, was losing establishments at a rate of four per month, amounting to an overall rate of decline of 45 per cent (ABS 1986c).
7. Data for Victoria shows that average plant sizes in the clothing industry are significantly larger in non-metropolitan areas, at 87.1 employees, than in inner Melbourne, where the average is just 35.9 employees (ABS 1986c).
8. The 1986 Census of Population and Housing reveals that, in Sydney and Melbourne, where two-thirds of the clothing industry's workforce was born overseas, almost one in ten of this immigrant workforce had been resident in Australia for less than five years.

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THE LIMITS TO 'JAPANISATION': JUST-IN-TIME, LABOUR RELATIONS AND THE UK AUTOMOTIVE INDUSTRY

P. TURNBULL

P. Turnbull, 'The limits to "Japanisation": Just-in-time, labour relations and the UK automotive industry', *New Technology, Work and Employment*, vol. 3, no. 1, 1988, pp. 7-20.

Competition from Japanese manufacturers has been particularly fierce in the automotive industry. Consequently, many British manufacturers are now emulating the production and employment policies of their Japanese rivals. But there are limits to such a process, especially in the sphere of labour-management relations and the control of work.

The Process of Japanisation

A new type of organisational culture is needed corresponding to the best elements of Japanese manufacturing systems engineering. The Japanese are confident that we won't do it, with all the implications that we are stupid and don't understand how. If that doesn't make you mad and determined to prove them wrong—nothing will[1].

It is now widely recognised that Japan's industrial success is due predominantly to management's organisation of the manufacturing labour process and its surrounding supports, or more precisely the 'just-in-time' (JIT) production system. Richard Schonberger, a leading American analyst and exponent of JIT, has even described JIT as 'the most important productivity-enhancing innovation since Frederick W. Taylor's scientific management at the turn of the century'[2]. But while the productive potential of

JIT is generally accepted by both academics and practitioners alike, there are countervailing and often contradictory interpretations of both the generic significance of JIT and its implications for labour. The reason for the extremely polarised interpretations of the system rest with the fact that some commentators view JIT as both a qualitatively different system of production and a system capable of reversing the deskilling process inherent in the Fordist model[3]. Others see it primarily as a method of eliminating key imperfections in the Fordist system, making it possible to combine product diversity with mass production without any significant reskilling. According to this interpretation, just-in-time is 'not an alternative to Taylorism but rather a solution to its classic problem of the resistance of the workers to placing their knowledge of production in the service of rationalization'[4]. Proponents of JIT admit that 'the Japanese out-Taylor us all'[5], but they maintain that improved efficiency derives simply from eliminating wasteful/unproductive operations in the performance of work—'each worker must understand that the elimination

of wasteful operations will never lead to harder work. Instead, the goal of the improvement program is to increase the number of net operations with value added that can be performed with the same amount of labor ... Unless this point is fully understood, the [JIT] system is hard to apply, especially in an environment where the labor union is strong[6].

While substantial ambiguity remains as to the implications of JIT for work practices, the effects of JIT on productivity, efficiency and competitiveness will depend, like Fordism and other revolutionary production systems before it, on the strategic choices of management and the manner in which trade unions resist or mould those practices to their own advantage. As a principal Japanese exponent of the JIT system has argued, 'there is no problem for foreign companies adopting this system except for the possibility of union problems'[7]. It is hardly surprising, therefore, that Japanese firms investing in Britain have shown a strong preference for 'greenfield' sites (or at least nominally 'green' workers), single-union agreements, and binding arbitration often with a no-strike clause. But even British firms operating 'brownfield' sites have been able to introduce Japanese style working practices virtually unopposed, largely because of the weakened bargaining position of trade unions and the very low ebb of industrial conflict[8]. There are, however, still limits to the process of adopting JIT and other 'Japanese' practices identified with successful Japanese companies, even in an environment where unions are very firmly on the defensive. It is precisely because many commentators (and managers) have failed to recognise the extent to which JIT is predicated on a specific form of union organisation and interest representation that is incompatible, if not antithetical to the tenets of British trade unionism that they have misunderstood and misrepresented both the process and possible extent to which the 'Japanese Way' will pervade the contours and constitution of British industry.

It is pertinent to the analysis of 'Japanisation', therefore, to examine in some detail the nature of JIT production and inventory control and its surrounding supports. This highlights both the pivotal role of industrial relations in the operation of such systems

and the processes through which JIT is undermining existing industrial relations procedures in Britain. Herein lies the principal source of inertia for British firms attempting to emulate their Japanese counterparts. JIT is a highly developed form of work intensification which belies any notion of job enrichment through teamworking, flexibility and job rotation claimed by the many proponents of JIT (in fact, job rotation, teamworking, flexibility and the like are the very tools of work intensification under the JIT system). As such the adoption and development of JIT is likely to be resisted, or at least mediated by trade unions and their members. Consequently, the implications for workers in general, and organised labour in particular, are explored in some detail, with specific reference throughout to the British automotive industry and its recent experience with JIT.

Just-in-time production and inventory control

For a precise definition of JIT, a "philosophy directed towards the elimination of waste, where waste is anything which adds cost, but not value to a product" can hardly be bettered[9].

Just-in-time is basically aimed at securing time economies in the circuit of capital and new ways of extracting productivity improvements from the labour force. This is achieved by increasing the *rate* of throughput through the plant, thereby increasing the turnover ratio of capital (total sales ÷ total assets) and the total productivity of the plant. With JIT the exact quantity and uniform quality of (defect free) raw materials, parts and sub-assemblies, are produced and delivered *just-in-time* for the next stage of the production process, which enables the firm to minimise the time taken between materials intake and goods dispatch. In order to realise JIT perfectly, defect-free parts must flow to the subsequent process. JIT is therefore operated with the reciprocal concept of total quality control, which eliminates the time and costs associated with reworking parts, re-scheduling production, dealing with customer complaints and coping with warranty claims.

The systematic improvement of quality challenges the conventional wisdom of Western manufacturers who argue that quality, because it costs more, must adversely affect

productivity[10]. The Japanese have illustrated that this view is simply incorrect. When direct production workers are assigned responsibility for quality control, as they are in Japan, then the firm not only cuts costs by eliminating (indirect) grades of quality inspectors but also by increasing throughput: defective parts are no longer produced and therefore less 'unproductive' time is spent reworking parts; the production process itself is simplified because defective parts need no longer be re-routed through the plant along 'rectification loops'; and less waste means lower buffer stocks to guard against quality problems. The experience of Japanese manufacturers has shown that, for machining intensive operations, a 2% reduction in the defect rate can produce a 10% increase in productivity through precisely these mechanisms[11]. Consistent with this finding is the recent experience of a UK engine component manufacturer operating a JIT system with Statistical Process Control (SPC). The defect rate was reduced from 8% to 4% over a twelve month period during which time labour productivity increased by 25% and unit costs of production fell by 11%[12].

Sub-standard production is one of the most unnecessary and most costly elements of the manufacturing process. In the British automotive industry non-conformance with quality and product requirements can cost anything between 25% and 30% of total sales revenue[13]. But if defective production is one of the most costly elements of waste in the manufacturing process the most visible sign of waste in any factory is the accumulation of stocks on the shop floor (whether these are raw materials inventories, 'buffer stocks' of work-in-progress between work stations, or stocks of finished goods awaiting dispatch). In each case capital lies idle on the shop floor, while the goods themselves are accumulating cost but not value. Stockless production is thus the ultimate objective of Japanese firms, but JIT aims to eliminate all costs surrounding the production process and not just those associated with excessive inventory levels. Of equal importance are the unproductive or wasteful elements of the worker's labour such as waiting time, downtime, and excessive set-up times. The reduction of set-up times is of particular importance for a number of reasons.

By reducing machine set-up times firms need no longer amortize set-up costs over

long production runs. Having reduced the minimum efficient scale of production firms can now produce smaller quantities of any particular product on an economically viable basis, enabling them to switch production more frequently and/or increase their product range. Firms employing JIT therefore invest in multi-purpose machinery and tooling with quick changeover dies, calibrated machine tools that eliminate trial and error adjustments, and special jigs that facilitate the achievement of 'single set-up' (a single digit number of minutes) or 'one touch set-up' (zero set-up time or only load and unload time). Machines are also fitted with automatic stop devices that shut down the machine at the end of each product cycle (or when machining tolerances exceed acceptable limits), and machine set-ups are included in the job descriptions of direct production workers rather than a separate grade of (craft) tool setters. This means that workers need no longer 'baby-sit' machines but can instead hasten to other machines to load or unload materials and prepare the machine for the next product or process.

The competitive advantage derived from JIT is that it enables the firm to manufacture in small batches while retaining the advantages of mass production. By offsetting the economies of long production runs firms can manufacture the same end products every day rather than assemble products in batches for a set period (usually several days) before changing over to another product. 'Mixed assembly' under a JIT system enables production to be planned in such a way that the firm is more responsive to product market demand, and it enables production planning to achieve a more uniform flow of production within the plant. The production schedule for the whole plant is determined by final assembly by 'homogenizing' the final assembly sequence and then minimising any fluctuations in the final assembly stage (known as 'level scheduling' or 'smoothing production')[14]. The final assembly sequence determines the rate of production for all preceding processes such that the demand for parts/sub-assemblies is allowed to 'ripple back upstream' through the production process. That is, the production rate of any one process determines the depletion rate and thus the rate of replenishment of components, parts or sub-assemblies from the previous process. The demand for parts is therefore 'pulled through' the production

process, typically controlled by production order cards called 'kanban'. In this way each stage produces, *just-in-time*, only that amount of parts necessary to complete the next stage of the production process.

These principles are extended backwards to the firm's suppliers who not only deliver (smaller) more frequent supplies of materials/parts on a just-in-time basis but also synchronise their production sequence to match the assembly plant's production schedule. As a result of this system the Japanese automotive industry is highly integrated and pyramidal in structure, with the major motor corporations at the top and a myriad of subcontractors at the bottom. In between there is a network of suppliers dominated by around 150-300 major suppliers for each motor manufacturer awarded long-term, single-supplier contracts (the top 350 component suppliers account for around 90% of final output, 80% of which is sold directly to the vehicle manufacturers)[15]. Below the major suppliers are two, three or even four hierarchical layers of subcontractors who supply the bulk of Japanese manufactures (around 60%)[16]. Toyota, for example, has around 170 (dedicated) primary suppliers for its major bought-in components. These firms depend on a secondary network of suppliers numbering well over 5,000 firms, who in turn depend on a tertiary, outermost circle of subcontractors numbering tens of thousands[17].

Japanese motor manufacturers not only source more of their components externally (up to 75% compared with around 48% in the USA and between 50-60% in Europe), they also exercise greater control over their suppliers. Industrial groups centred around the major motor manufacturers such as Toyota and Nissan comprise firms that are legally separate and independent for financial purposes, but operationally co-ordinated within a multi-layered, tightly knit equity structure of minority shareholdings. The Japanese automotive industry is therefore characterised by vertical contractual dependence rather than vertical integration. The advantages this bestows on the motor manufacturers (and some of the major component suppliers) are precisely those advantages associated with vertical integration, but with greater flexibility and without the cost penalty of high compensation levels in the supplier chains that typify integrated production systems in the West. Japanese motor

manufacturers can therefore source more components externally from subcontractors who pay on average 33-44% lower wages[18].

A similar industrial structure is now emerging in the British automotive industry[19]. All the major vehicle assemblers now expect just-in-time deliveries from their suppliers[20], and contracts are now awarded on a long-term basis often with just one supplier. This has greatly reduced the number of primary, direct suppliers to the vehicle manufacturers. Austin Rover has reduced its number of 'preferred suppliers' from 1,200 to just 700 between 1982-86 and intends to reduce the number still further; Ford UK has reduced the number of its (European) suppliers from around 2,500 to 900 over the same period; Jaguar is planning to axe up to 300 of its 650 suppliers over the next four years; Nissan intends to single-source all its components from fewer than 150 suppliers by 1990 and will encourage those suppliers to establish plants in the North East; and JI Case, an agricultural equipment manufacturer, has recently cut its supplier base and demanded that those that remain establish consignment stores close to the Case plants to make JIT deliveries (the components will remain the property of the supplier and will only be paid for by Case when they are released onto the production line). Vehicle manufacturers are also buying in more built-up 'component systems' rather than individual components, both to reduce the primary supplier base and to reduce the amount of assembly work carried on at their own plants for which they must usually pay a higher wage premium. The increasing number of joint ventures within the industry, especially with Japanese manufacturers seeking to supply Nissan and the Honda engine plant at Swindon,* also signals moves towards industrial groups as found in Japan, as does the sale of minority (or even majority) shareholdings in some of Britain's most prominent component companies. The recent sale of Lucas Electrical's lighting division to Corello and its rotating machines business to Magneti Marelli, both part of the

* There are already a number of Anglo-Japanese joint ventures in the domestic automotive industry including BL/Honda, Bedford Vans/Isuzu, NP Echo/Kanto Seiki, Hoover International/Ikeda Busan, TI Nihon Radiator and TI Fulton/Sano.

Fiat group, is the most recent example of these trends.

Perhaps the major advantage of industrial groups, a pyramidal industrial structure, and vertical contractual dependence is the ability it bestows on the major corporations to accommodate the vagaries of the market and their own production schedules without adversely affecting corporate growth, profitability, or employment security. Demand fluctuations of up to plus or minus 10% can be accommodated simply by changing the frequency of kanban transfers within the plant (larger fluctuations require a revision of the total number of kanban cards, cycle times and job allocations). 'Fine tuning' production thus allows the major corporations to maintain their current employment levels (or possibly dismiss only temporary or seasonal workers) while the firm's subcontractors bear the brunt of any demand fluctuations or schedule revisions. It is these firms who must layoff workers or accumulate stocks to cope with constant revisions to production schedules, while the major corporations hold out the prospect of permanent employment for their (core) workers at relatively little cost to themselves.

JIT and work intensification—re-inventing the conveyor belt

In the traditional batch production environment, the workers are like servers in a conventional restaurant, in the JIT environment they are like servers in a fast-food restaurant[21]

The elements of 'waste' within the production process referred to thus far are generally regarded as elements of 'pure waste'. For example, stocks of work-in-progress, waiting time, and quality inspectors are all facets of production that add no value to the finished product. The next stage in the process of waste elimination is to focus on those operations that add both cost and value to the product, with the aim being to retain only the net value adding operations. Reducing set-up times is an obvious example. But the main focus is on labour itself, eliminating all wasteful motions in the performance of work. The net result, when combined with job flexibility and upwardly mobile task allocation levels, is the continuous reduction of labour. Through a process of continuously improving the firm's manu-

facturing operations workers 'are exposed to continual, controlled pressure'[22], and 'are never allowed to settle into a comfortable pattern; or rather, the pattern becomes one of continually perfecting the production process'[23]. With JIT 'perfection' means the continuous rationalisation of production, operating the manufacturing process with ever fewer workers upon whom the costs of production fluctuations and the burdens of productivity improvement are concentrated[24].

The route to eliminating all wasteful operations is to move towards single-unit production, which allows for much tighter control of the production process and work allocation, greater labour utilisation, and the progressive standardisation of each job task. Rather than manufacture products in large lots or batches, the objective of the JIT production system is to reduce lot-size all the way down to one unit. That is, to manufacture one unit after another *continuously*. Thus, with JIT one unit of finished output is produced in every cycle or tact time, which is equal to the operating time per day divided by the necessary output per day. The cycle time is therefore the specified number of minutes and seconds that each worker is allowed to complete one process, product or part. In Japan, job flexibility, job rotation and, most importantly, upwardly mobile levels of task allocation set by management ensures that the number of workers necessary for each process to produce one unit of output in a cycle time is determined simply by the necessary days output (there are very few, if any, union restraints on the allocation of labour)[25]. The workers are simply allocated to their work tasks so that each process is operated by the minimum number of workers required to produce the necessary output. This is achieved by having the worker move between several different machines *in conjunction with* work moving through the factory by means of manual (single-unit) transfer, conveyors, chutes, and pick-and-place robots that transfer work from one machine or process to the next.

This form of work organisation and conveyance differs markedly from traditional Western practices. The key to production control under the Fordist system was the equalisation of conveyance times between work processes by means of a moving conveyor belt. The line was therefore 'balanced' by means of the conveyor belt itself, which

transferred work from one stationary worker performing a narrowly-defined task to the next, equally deskilled worker. Improving labour efficiency and factory productivity under this system focused attention on speeding up the work of individual workers or work processes (which amounts to roughly the same thing). But the net result is often to unbalance the line and create bottlenecks between different work stations (clearly the same argument applies to batch as well as assembly line operations). The assumption that workers should remain stationary in order to maximise their *individual* efficiency is therefore inappropriate when attempting to line-balance the whole factory operated by the *minimum number of workers*. The key to single-unit, just-in-time production is therefore flexible work allocation and new workplace layouts that create an 'invisible conveyor' between 'multi-functional workers' operating several different machines.

The most visible strategy of firms operating a JIT system is therefore the reorganisation of the factory layout into 'group' rather than 'process' or 'functional' technology. Instead of grouping machines of similar types in concentrated blocks on the shop-floor, with work passing between different process groupings interspersed by (prolonged) periods in work-in-progress stocks, machines are located in close proximity to each other—to physically prevent the accumulation of stocks and to minimise walking distances between machines—according to the consecutive stages of the manufacturing process. The new groupings of machines operate similarly to an assembly line, and unlike process groupings where the pace of each process is effectively decoupled from both subsequent and preceding operations by work-in-progress stocks, group technology enables the firm to couple the pace of work with all other processes. Discrete products or 'product families' that follow approximately the same production routing are allocated to several 'product lines' or 'manufacturing cells' determined by these routings, and these cells then operate like mini-factories within the factory. The firm can not only economise on storage and material handling costs, but is able to compress production lead times, increase the rate of throughput, and monitor production flows more precisely.

Ideally, the factory is reorganised into

several interconnected U-shaped cells. Within each cell workers are allocated to several different machines and by interconnecting these U-shaped cells it becomes possible to re-allocate job tasks and the number of machines operated by each worker along each product line or manufacturing cell. In fact, this is the primary objective of job flexibility and job rotation, 'to reduce the number of workers even in the period of increased demand'[26]. Instead of job enrichment we have a process of work intensification, and instead of reskilling the workforce it becomes 'necessary to have machines that even a newly hired, unskilled labourer will be able to become fully proficient on within three days'[27].

This U-shaped layout is precisely the form of factory layout at Lucas Electrical's starter and alternator plant (BW3) in Birmingham[28]. Each U-shaped cell or 'module' buys-off production from the previous cell as work moves through the plant from one cell to the next. Within each manufacturing module there is job flexibility across different work tasks but flexibility is restricted to a pre-determined, union negotiated number of machines per worker (unlike Japan, where job allocation is often changed by management on a daily basis to meet the cycle times determined by the day's target output[29], the allocation of machines at BW3 is fixed until a new allocation is negotiated). Nevertheless, the redesign of a three factory system into a single unit with sixteen manufacturing cells has still served to intensify the work process by breaking down demarcations across craft groups and maintenance workers, by increasing flexibility across semi-skilled tasks, and by simplifying the supervisory structure (the three supervisory grades SF1-3 have been rationalised to just one, the Module Leader, by eliminating SF3 and merging SF1 and SF2). Thus, despite greater flexibility and the erosion of traditional demarcations there is no systematic evidence of any significant re-skilling or skill enhancement—"The jobs are just the same as before, you just do more of 'em. And there's no big deal to assigning quality inspection to direct operators—you just stick the components under a feeler gauge several times a day to check things are going OK"[30].

At the BW3 plant the traditional production control and progress chasing departments were closed, the staff was reduced

by 300, and a new Manufacturing Systems Engineering development function installed to monitor and control the new module system. Within eighteen months of reorganising the factory layout productivity increased by 25%; lead times were reduced from fourteen days to just one day; in-cell work-in-progress was reduced by 90%; stock levels were reduced by £1.5 million; the overall business stock turnover ratio (sales - stocks) increased from seven to fifteen times (on an annual turnover of £60 million); and the final assembly stage, which works on a mixed mode manufacture of starters and alternators, operates with only fifteen minutes of stock.

Similar results have been achieved at the Lucas Electrical and Electronic Systems instrumentation plant at Ystradgynlais (S. Wales). The firm's product base at this plant numbered around 2,500 different varieties, but it was possible to identify three distinct 'product families' each with its own characteristics. These three families formed the basis of three new 'business units within the business', each supported internally by an electronics manufacturing unit and a print and spray unit (these two units were classified as the supply business and operated on a supplier-customer relationship similar to other external suppliers)[31]. Within the business units plant and equipment were reorganised into U-shaped cells, with assembly on a 'unit build' basis controlled by computer to allow a 'one-by-one' build capacity. Raw materials stores were brought on-line, the old piecework (PBR) system was removed, and teamworking concepts were instigated. Figure 1 illustrates the original layout and the kanban redesign of one particular U-shaped cell operating on the concept of kanban square (that is, an empty square provides the trigger to build, allowing only one unit of work-in-progress between operators). This particular cell reduced its batch size from four to just one unit; reduced work-in-progress by 99% (to just 14 units on-line); reduced lead times from 5 days to 35 minutes; reduced raw materials by 40%; eliminated the old conveyor system; reduced floor space from 1,500 sq ft to 1,000 sq ft; increased its stock turn from 4 to 30; and increased the ratio of value added to non-value added by 60%[32]. In just one year the plant as a whole increased productivity by 35%, reduced process changeover times to not more than 5 minutes,

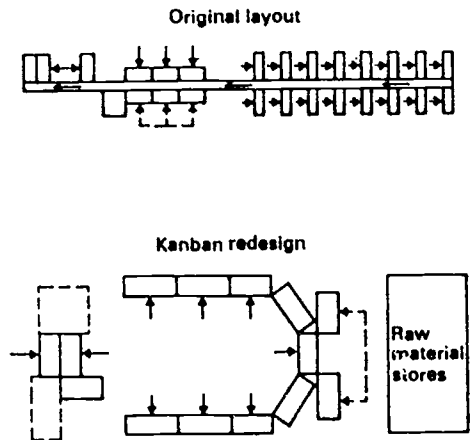


Figure 1: Cell Reorganisation at LEES Ystradgynlais.

Source: J. Wood, 'A Systems Approach to Business Redesign', in J. Mortimer (ed) *Just-In-Time: An Executive Briefing*, p. 87, 1986, IFS Publications.

reduced total stocks by £3.5 million, and increased the total stock turnover ratio from 7 to 21 (on an annual turnover of £28 million).

The wider implication of single-unit JIT production, as illustrated by these two plants, is that batch production processes can be transformed into a continuous flow operation, recreating the rhythm of assembly line pacing in plants where there were previously opportunities for workers to determine (to some extent) their own work pace (an obvious example is the situation where workers can build up banks of work-in-progress for the next work station and then take a rest period while the subsequent process 'catches up'). Maximum labour utilisation is most easily achieved with U-shaped layouts as employed at BW3 and Ystradgynlais[33], but not all manufacturing plants, products or processes are suitable for U-shaped machining lines. At one UK engine component company[34], for example, the plant was reorganised into seven product lines along which multi-functional workers walk between different machines. At this particular plant, the level of stocks were reduced from nine weeks supply to just ten days; throughput time was reduced from eight weeks to only seven days (much

of this time being accounted for by a heat treatment process and subsequent cooling process); the number of rejects at test were halved; machine utilisation was increased from below 70% to almost 90%; and lead times were reduced from around three months to just ten days. As the company's Chief Engineer put it, "Nothing stands still anymore", and that includes the workers themselves. Yet again there is evidence of an increase in workers' responsibilities, but there are no clear signs of any extension to either the level or exercise of workers' capabilities.

It has been noted already that there is disagreement over the implications of JIT for workers, their unions, and the conduct of industrial relations more generally. As with other forms of work organisation JIT could, if suitably modified, offer the opportunity to reskill work and enrich the jobs of working people. But management interest in JIT is not derived from any predilection for the well being of the worker. Their interest comes instead from the quest to realise levels of productivity comparable to those of the best Japanese companies. The reskilling of jobs becomes more of a theoretical fantasy than a concrete reality in a climate where unions are on the defensive and workers are the recipients rather than the actors in the process of 'Japanisation'.

The one lesson from Japan that many British firms appear to have taken to heart is that management must reassert their 'right to manage' and restore their traditional hegemony in the workplace. The so-called 'cooperative' elements of Japanese practice such as teamworking, quality circles, and mutual trust between management and workers are also extolled, but they are often subordinated to and designed to facilitate the process of work intensification. The function of teamworking, job flexibility and the like has been to redefine the level of work effort and customary levels of active cooperation on the job. These practices not only complement attempts to intensify work by encouraging workers to internalise the company goals of efficiency and quality, they also help to marginalise the role of union representatives at the workplace. It is in this respect that the dependence of JIT on a specific form of union organisation and interest representation is highlighted, and where British firms have encountered significant problems.

Just-In-Time and industrial relations—the limits to Japanisation

Faced with the choice of going on the dole or working like the Japanese, the men so far would prefer the dole. It's as simple as that[35].

A number of limits to the Japanisation of the British automotive industry have already been intimated. The most obvious are the problems that develop between vehicle manufacturers and their suppliers in establishing long-term, single-supplier relationships based around the concepts of zero defects, statistical quality control, and just-in-time scheduling and delivery. While there are obvious advantages to a more co-operative relationship, especially in terms of volume and design work at the early stages of product development, a primary motive behind 'preferred supplier status' is to push costs back onto suppliers and gain greater control over the cost structure of suppliers' components.

In the early 1980s there was some justification to this process given the uncompetitive position of the British components industry.* The price differential between British and foreign components has now been virtually eliminated, especially after the recent depreciation of sterling[36], but many component manufacturers are still being squeezed on price. In addition, they now face the burdens of quality assurance, the provision of (supplier financed) security stocks, and setting up consignment stores close to their major customers as part of the move to JIT deliveries. The problems this creates was recently highlighted by the televised example of a potential supplier to Komatsu who turned down a contract after six long months of negotiation, having been squeezed to the limit on price and resentful of the interference of Komatsu management in the running of his business[37].

The labour relations consequences of the long-term squeeze on prices combined with JIT deliveries of vital components are only just beginning to surface. They signal serious problems, if not a gross miscalculation, of

* In mid-1980 BL found that it could buy 70 per cent of its bought-in components overseas at an average price of 20 per cent lower than from its UK suppliers.

both the transferability of Japanese techniques and the extent to which British workers can be cowed by the threat or actual experience of job loss and factory closure. In the late 1970s industrial disputes were identified in no uncertain terms as 'the major cause of unreliability in the components industry'[38]. Between 1974-79 the motor vehicles industry (MLH 35) lost over 12.5 million days through industrial disputes, but since 1980-86 has lost only 3.5 million days. Very few component manufacturers have experienced anything like the pre-1980 level of industrial action either, and the motor manufacturers have consequently pushed forward their programmes of japanisation with scant regard for the representations of their own or their suppliers employees. But if any suppliers do experience a strike, then with only days of stock-holding for many components and no alternative source of supply the motor manufacturer is very quickly faced with the prospect of having to stop production and layoff workers (Austin Rover now hold only three or four days stock of many components). In the absence of industrial disruption JIT has proved to be the most cost effective route to low cost, high quality production. In the face of industrial action, however, it appears positively anaemic.

Management and unions alike now appear to be waking up to this 'Achilles Heel'. After several years of 'corporate incomes policies', non-negotiable pay offers, or negotiated wage increases below the rate of inflation, many component firms are no longer able to sustain the commercial and labour relations strains of an imposed price squeeze. A. J. Williams, a Midlands based company that is the sole supplier of door handles for the Longbridge-built Metro and window trim for the Cowley-built Maestro and Montego, recently faced a strike threat by its 130 employees over its imposition of a 2% pay increase. The workforce were under no illusions about the reason for the cut in their real wages—"Rover and the whole motor industry is trying to screw all its suppliers into the ground on price, and the employers' in the supplier companies in turn are trying to screw their workforce into the ground on wages"[39]—a situation exacerbated by the higher wage increases awarded by AR. The dispute, although confined to an overtime ban, caused problems of supply and brought AR into the fray. An approach to ACAS by

AR management, although leading to talks, failed to break the deadlock, but the dispute was resolved the day before an all out strike was due to commence after Williams management increased its pay offer to 4.5%. This is not the first time that AR have become involved in the pay negotiations of their suppliers.

The only strike to halt production at AR in the past seven years was in October 1986 at Lucas Electrical (LE). Again an overtime ban was sufficient to disrupt production,* and the strike was only resolved when LE management, under pressure from AR to settle the dispute, doubled their original pay offer. The significance of the dispute was that it highlighted the susceptibility of JIT to even low-cost forms of industrial action. At the time the LE plants were working virtually around the clock to meet production targets, hence the immediate impact of the overtime ban. But the sensitivity of JIT to low-cost forms of industrial action is more innate.

With its 'no buffer' principle JIT production is all the more susceptible to problems created by machine breakdown, defective parts production, or material/parts shortages. But this susceptibility is regarded as a virtue, because it forces workers to rectify problems immediately as and when they occur[40]. The calculation of cycle times incorporates this principle explicitly by making no allowance for machine or any other form of downtime (Western manufacturers typically operate with a sizeable percentage of 'slack' included in the calculation of machine utilisation, setting output targets on the basis of, say, 85% utilisation). Working on the assumption of 100% machine utilisation means that if production targets are not met within normal working hours the employees must work overtime[41]. This accounts for the very high level of overtime worked in Japanese automotive companies and why workers 'often fail to stop the line when they should and even enter the next process to complete their assigned tasks; i.e. they force themselves to finish their jobs in spite of the supervisor's instructions to stop the line if they are delayed or become

* At the time AR's market share had fallen sharply and the unions accused AR management of laying off workers simply because they were stockpiling cars. But as the dispute escalated into an all out strike the outcome would have been the same.

tired'[42]. The converse of systematic overtime to meet production targets is clearly that overtime bans have an immediate, deleterious effect at both the component manufacture and its customers.

The sensitivity of JIT to any form of industrial disruption is therefore extreme to say the least, as is the vested interest of management at the vehicle manufacturers in the industrial relations practices of their suppliers. This was again illustrated by a dispute involving AR, this time at the Cowley plant. Because AR now expects JIT deliveries from its suppliers and holds only several days of stocks, many smaller firms have faced the problem of storing components which the majority still produce in large batches. British Road Services (BRS) has therefore established a storage depot within a mile of the Cowley plant and the firm takes responsibility for storage, selection, transport and delivery of components. Twenty BRS employees work at the Cowley plant, engaged in delivery work to the assembly line as the plant is not designed for direct delivery to the line (unlike Japanese plants such as the Nissan Tyne and Wear plant). Although AR is prepared to subcontract this work, as it severs the link between material handlers and other production workers, AR still wish to retain some influence over the terms and conditions of these employees, as illustrated by AR's attempt to force the BRS employees to clock on and off. A strike threat by the 20 workers brought an immediate climbdown by AR management, indicating once again the susceptibility of JIT. Unlike their Japanese counterparts it appears that British motor manufacturers will experience far greater difficulty in their attempts to influence the employment practices of their suppliers and to use those suppliers as a device for cutting wages/costs.

The implication of this, however, is not that JIT will not be adopted in the British automotive industry. Quite the contrary. Japanese techniques such as single-supplier status, zero defects and JIT deliveries are now accepted norms in the industry[43] (a distinction must be drawn, however, between firms being forced to make JIT deliveries to their major customers and firms adopting a full JIT system involving synchronised production and delivery – even among the Toyota network only 50% of suppliers operate in-process JIT, although 98% of deliveries are on a JIT basis)[44]. The

real implication is that JIT will have to be adapted to the British context to meet the specific structure and procedures of existing industrial relations practices. Otherwise we might again witness an escalation of industrial conflict within the industry. JIT functions with so few problems in Japan because of the nature of trade unionism and management-labour relations in the Japanese automotive industry.

The structure of trade unionism and the pattern of industrial relations in the Japanese auto industry were established during the early 1950s when the militant, industry-wide auto union (Zenjidosharoso) was defeated and subsequently dissolved in the wake of two major disputes at Toyota (in 1950) and Nissan (in 1953). In its place the motor manufacturers established their own conciliatory, company based unions that have collaborated with management in the rationalisation of production, job flexibility, and the development of individualised payment systems that promote an extreme form of competition and meritocracy among the workforce. At Toyota, for example, 'personal wages' assessed and determined by the worker's supervisor account for 40% of total pay; 'job wages' determined by a job evaluation scheme make up 50% of total pay; and 'ability wages', based on an evaluation of skills and the level of ability executed on the job, account for 10% of total wages[45]. Individual wages are therefore absolutely individual, with the differentials between employees performing similar jobs becoming cumulative over time. The net effect is that, by disconnecting the wage system from work assignments, Japanese management has 'developed an independent system of wage careers that promotes ambition and competition among the workforce without requiring any changes in the skill pyramid. Extremely strong competition between workers is an important consequence that would be erroneously described as group orientation'[46].

It is precisely these arbitrary elements of managerial prerogative that British unions have strongly resisted in the past and that have, in some situations, formed the very bedrock of workplace union organisation. Establishing a 'rate for the job' is an obvious example, limiting managements' ability to pay two equally productive workers performing the same job different wages. Just because one worker has a more positive

'work attitude' (whatever that means), shows more initiative on the job, or is generally more co-operative is unlikely to cut any ice with British workers or their union representatives as acceptable grounds for awarding differential pay increases. In fact, many successful union organisation drives in the 1960s and early 1970s were founded on the fact that within many multi-plant firms workers performing identical jobs were paid different rates of pay. Managements' inability to sustain wage differentials across plants, let alone within plants, may well limit the efficacy of JIT unless other means of promoting worker effort are established.

There are, of course, examples of Japanese firms operating greenfield sites in Britain where individualised merit payment systems are on the agenda (Nissan and Komatsu are two prominent examples). Similar trends are afoot at British firms[47], most notably Bedford Vans, Cummins Engines and Lucas Industries. On their own, individualised payment systems may appear fairly innocuous, but individual assessment is usually based on company procedures that deliberately exclude existing forms of union regulation and channels of union representation. As part of the joint venture with Isuzu, Bedford Vans is proposing a new company joint council which would be responsible for the negotiation of future wage increases rather than the joint union negotiating committee which has direct links to the official union structure. The company council would also be responsible for individual grievances and disciplinary matters, as well as acting as a consultative forum. The motivation behind the council, apart from transferring control over pay and conditions to management, is to establish a conciliation and arbitration system that would make future industrial action a rarity. The objections of the T&G to the joint venture with Isuzu, summed up by Mick Murphy, a national union official, are therefore well founded—"If I was obliged to work under these conditions I would question the relevance of trade unionism. I would wonder why I was paying my union subs"[48]. Mr Murphy has hit the proverbial nail right on the head, because if workers surrender the protection of individual rights through autonomous collective representation then they abandon the rationale of trade unionism itself.

The repression of trade unionism is being resisted at Bedford Vans and other British

firms attempting to introduce Japanese techniques. At Lucas Electrical, the modular form of work organisation has challenged the very basis of multi-unionism and old-style demarcations which gave rise to the specific form of work group shop steward organisation. With greater flexibility across semi-skilled tasks, and the integration of craftsmen into the (managerially defined) module teams, there is no longer any technical rationale for separate pay negotiations with craft groups and production workers. But the bargaining structure within the company has been undermined more by the sale and closure of various plants than the new modular production system. The shop stewards have been able to retain their role as the principal line of (independent) communication between workers and management, especially after their reorganisation around the new (natural) constituencies of each manufacturing module within sites, and the various craft groups have retained various independent negotiating rights. It seems likely, however, that in the near future the pay negotiations of these groups will be integrated with those of production workers as the company attempts to develop a more decentralised bargaining procedure at the plant level with a 'consortium' of trade unions (to replicate the supposed advantages of single unionism). Likewise the pay negotiations of white collar staff have recently been decentralised to the plant level, but here again the unions have retained some control over the procedures to be adopted (for example the unions have safeguarded national bargaining for conditions of service). As long as the unions retain their independent bargaining role and independent channels of worker representation then further changes to working practices or employment conditions will be subject to union regulation as in the past (a further example is union resistance to managements' attempts to increase the number of temporary employees to gain greater numerical flexibility, the outcome of which was that any temporary employees with 13 weeks of service are now accorded full-time status). Thus, while unions may be unable to prevent management from imposing Japanese techniques under the threat of closure or job loss, they will continue to be the main channel through which employees' interests are represented. For this reason alone the operation of JIT in a British context may prove to be increasingly problematic.

Conclusions—working to live or living to work?

The use made of some elements of Japanese industrial society is opportunistic, and largely lacking any deeper understanding of Japan ... maybe in five years time it will be viewed as just another management fad. But the fact that what passes for "learning from the Japanese" encompasses widespread changes in work organisation, severe rationalisation programmes and the like, should alert us to take a somewhat more serious view of the matter[49].

On her recent visit to the Nissan assembly plant in the North East Mrs Thatcher took the opportunity to castigate Britain's 'moaning Minnies'. The Japanese, now firmly established on British soil, would finally prove to British workers and management alike how to run a successful manufacturing company. The conditions for 'success' have been firmly laid at the Nissan assembly plant—union membership is below 25%; wages are negotiated in-house and are subject to the discretion of supervisors, and a company council deals with all individual and collective grievances. All-in-all the involvement of the AEU appears little more than perfunctory, and it is hardly surprising that the plant has been described as Mrs Thatcher's favourite factory[50]. But we should be wary of extrapolations from this and other Japanese plants which suggest that Japanese management techniques are generic rather than specific to socio-economic environment and culture.

The success of Japanese firms, whether operating in Japan or Britain, appears to have imbued many British managers with a 'missionary zeal' to transform their manufacturing operations and convert their workforce to the 'Japanese Way'[51]. But if we step back from the euphoria surrounding JIT and uncover the causal relationships behind the so-called 'Japanese Miracle' then we discover that the deleterious effects of JIT affect all and sundry. The experience of British firms operating JIT illustrates both the degree of work intensification involved and the added stress that is endemic in the system. The compensation for job flexibility, work intensification and added stress is greater job security for 'core' workers, often in the form of 'life-time employment'. But very few British firms are in a position to offer their employees enhanced job security in the current economic climate. This is not so far removed from the situation of Japanese

firms as one might at first expect. Permanent employment for Japanese workers is neither legally nor contractually guaranteed. It is derived from, and is dependent upon the continued economic success of *their* firm, and is therefore no different from the life-long employment assumed by many British workers employed by successful firms such as Lucas Industries in the halcyon-days of the 1960s[52]. The major difference is that because large Japanese firms recruit only young workers to be bottom of the job hierarchy, with virtually no subsequent inter-firm mobility without a significant loss of earnings potential, 'life-time employment' for many Japanese workers can be more like a 'life-time sentence'. Suicide is now one of the most popular ways to escape this sentence[53].

The economic success of the large Japanese corporations, who are the only firms able to offer life-long employment, is secured not only at the expense of 'core' workers who must succumb to work intensification and the dictat of management. Large firms usually employ as many seasonal/temporary workers as they do permanent employees, the latter being predominantly male which adds another dimension to economic dualism. Another employment buffer is provided by the subcontractors of the firm's primary/preferred suppliers who are unable to confer life-time employment on their own employees given the variability of monthly production schedules received from their customers (suppliers regularly report monthly discrepancies of plus or minus 20% from the initial plan)[54]. As a result only around 25% of all Japanese workers have life-time employment status (a percentage similar to that of Britain and other Western economies)[55], while 65–70% are non-permanent workers employed by the smaller/subcontractor firms. In addition, an estimated 3.5 million workers are employed/unemployed on a daily basis[56]. Economic dualism is vital to the operation of JIT and the economic success of large corporations, and is therefore responsible for the relatively low quality of working life in Japan.

Given the structure of occupational labour markets and the nature of British trade unionism it seems unlikely that the British economy could ever be subject to a comparable degree of economic dualism, although one can detect the embryo of such a system

developing in the automotive industry. What the current state of the labour market does allow for, however, is the blind adoption of Japanese techniques with only minimal opportunities for the representation of trade unions and their members to be taken into consideration. With a number of highly sensitive 'choke points' inherent in the JIT production system, triggered off by relatively low-cost forms of industrial disruption such as an overtime ban, the withdrawal of co-operation from flexibility agreements, or the refusal to cover for absent colleagues, one can already detect potential problems ahead for firms that continue to impose new working arrangements regardless of union objections. Unless, of course, they dismember trade unions completely, which at present appears to be the preferred (long-term) strategy of some firms.

The success of this latter strategy is highly questionable. An overriding fascination with the tactics of successful Japanese firms such as JIT deliveries, kanban, zero defects, quality circles, company councils and the like, may obscure the strategic lesson of Japan's industrial success, namely that manufacturing excellence is critical. There is more than one route to competitive success, and we should question whether the Japanese model is not only transferable but more importantly whether it is even desirable. It is now a common aphorism that the Japanese live to work, whereas the British work to live. It should be added that the British worker also has a long tradition of seeking to live *while at work*.

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46. Dohse et. al., *op cit.*, p. 138.
47. Turnbull, *op cit.*, forthcoming.
48. *The Financial Times*, 23.7.1987.
49. George and Levie, *op cit.*, p. 42.
50. *The Guardian*, 18.6.1987.
51. *Engineering Computers*, pp. 55-60, September 1986.
52. Turnbull, *op cit.*, p. 195, 1986.
53. *The Guardian*, 18.8.1987, reported that Japan has experienced a rapid increase in the rate of suicide *per se* and the number related to work/job problems. A Japanese worker commits suicide every 20 minutes.
54. Monden, *op cit.*, p. 50, 1983.
55. See McCormick, B. J. and Marshall, G. P. 'Profit-Sharing, Job Rotation and Permanent Employment: The Large Japanese Firm as a Producers' Co-op', *Economic and Industrial Democracy*, pp. 178-9, Vol. 8, 1987, who report that the major difference between the West and Japan in this respect is that in the West more permanent workers are employed in the public sector, which is relatively small in Japan.
56. George and Levie, *op cit.*, p. 27. See also Hayes and Wheelwright, *op cit.*, p. 364.

ANNOTATED BIBLIOGRAPHY

- Hyman R. & Streek W. (eds). *New Technology and Industrial Relations*. Basil Blackwell, Oxford, 1988.

An important issue in any discussion on industry is the effect which new, flexible technologies will have on industrial relations. The book is organised into five sections. The first deals with theoretical interpretations, methodology and research strategy. The second looks at management initiatives linking technical change to work organisation. The third section analyses the debate over the implications of technical change for skills. The fourth and last sections look at trade union strategy and the actual workplace respectively. Important chapters to read are those by Streek and Sorge, Hyman, Wood and Armstrong.

- Knights D. & Willmott, H. (eds). *Labour Process Theory*. Macmillan, London, 1990.

This is an extremely useful volume which brings up to date the state of the debate on the labour process. In a comprehensive introduction Knights and Willmott explore the contribution of Braverman to the labour process debate. Not only do they outline Braverman's argument but they also deal thoroughly with the various critiques which others have made of Braverman. The introduction is followed by a theoretical review of the labour process debate by Craig Littler. It would be useful to read this chapter in conjunction with his monograph in this course. Other useful chapters enlarging on the debate are those by Thompson and Edwards while West explores the relationship between gender and the labour process.

- Lash S. & Urry J. *The End of Organised Capitalism*. Polity Press, Cambridge, 1987.

Lash and Urry argue that capitalist countries are changing from levels of organised capitalism featuring increasing centralisation, rationalisation and control to levels of disorganisation in the structuring of both the economy and urban and cultural space and time. In this context, a central argument suggests that the more extensively a nation's capitalism was organised, the more slowly that country's capitalism will disorganise. This thesis is examined by tracing this tendency to disorganise in five countries—the USA, Sweden, France, Germany and Great Britain. However, it is strange that the discussion does not include Japan and the newly industrialised countries of Asia.

Mathews, J. *Tools of Change: New Technology and the Democratisation of Work*. Pluto Press, Sydney, 1989.

Mathews in this book, and in the shorter papers cited in this monograph, emphasises how new technology and changes in the labour process can work to liberate the worker. This argument contrasts with that of Braverman in his seminal work *Labor and Monopoly Capital*, where the increasingly deskilled and degraded nature of work was highlighted. Mathews, essentially, argues from a similar position to that of Piore and Sabel, claiming that industrial development has reached a juncture which can either lead to more intensive and alienating work or, on the other hand, to work which provides greater flexibility, autonomy and fulfilment. However, in polarising the debate Matthews has tended to overlook the grey areas where Fordism and Taylorism themselves can be quite flexible as pointed out by Berggren in *The Transformation of Work?*. Thus, the flexible, more autonomous workplace may be just as intensive and coercive, although in different ways to those laid out along strict Tayloristic principles.

Piore M. & Sabel C. *The Second Industrial Divide: Possibilities for Prosperity*. Basic Books, New York, 1984.

Piore and Sabel's book is a seminal work which has sparked off a major debate on the status quo in the industrial world and the changes that are taking place there. They argue that currently there is a paradigm shift taking place with mass production, which superseded the earlier craft paradigm, going through a major crisis. This crisis is prompting enterprises to move toward more flexible systems of production which can more easily cope with the fluctuating demands of the market. The result is that craftworkers have been reskilled and work has been established on collaborative terms. Flexible specialisation is seen as a progressive movement where workers are reskilled and indeed upgraded with the reintegration of tasks

Robins K. & Webster F. *The Technical Fix: Education, Computers and Industry*. Macmillan, London, 1989.

This is a stimulating book that looks at the relationships among work, education and technology. The authors argue that the advanced capitalist economies are undergoing a major transformation in the way industry is being structured. This transformation, they argue, is linked to the establishment of greater flexibility in the new modes of production being established. Associated with these changes are new class distinctions and the introduction of new forms of social control. Thus, they contend that the reality of technology must be confronted to reveal the hidden values of technocratic thought.

Wolferen K. *The Enigma of Japanese Power*. Macmillan, London, 1989.

This is a recent, important book on the structure of Japanese culture and industry. It is essential reading because many of the critiques of the current changes in industry tend to be Eurocentric with little mention of Japan. If indeed Japan is mentioned it is usually in an uncritical acceptance of many of the myths that surround changes in Japan. The book dispels many of these myths arguing, for instance, that Japan is not the idealistic free market economy which many contend but is indeed highly controlled and centralised, not in a Soviet sense but using the concept of 'capitalist developmental

states'. Similarly, the author critically examined the dual structure of Japanese industry, the lifelong employment structure and the gendered nature of work in Japan. Also of considerable interest is his discussion of the Japanese educational system.

Wood, S. (ed.). *The Transformation of Work?*. Unwin Hyman, London, 1989.

The organisation of work is the major debate which this book discusses. In particular, the contributions to the book critically examine the flexible specialisation thesis proposed by Piore and Sabel. Wood, in a substantive introductory review to the volume, critically examines some of the major propositions associated with the flexibility debate, rejecting the polarised nature of the debate, while pointing to the persistence of low-skilled work, and the gendered nature of much work. This latter theme is explored in the two chapters by Walby and Jensen whose penetrating critiques dissect the arguments of Atkinson and Piore and Sabel. Other useful chapters are those by Berggren, who provides a detailed case study of the Swedish situation, and Kamazawa and Yamada who critically analyse the lifelong *nenko* employment practice in Japan.

ACKNOWLEDGMENTS

Reading 4 Jamie A. Peck, 'Circuits of capital and industrial restructuring: Adjustment in the Australian clothing industry', *Australian Geographer*, vol. 21, no. 1, 1990, pp. 33–52. Reproduced by permission of Dr Jamie Peck, School of Geography, Manchester University, Manchester M13 9PL, UK. Reading 6 reproduced by permission of Basil Balckwell.

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Peter Watkins is a Senior Lecturer in Social and Administrative Studies at Deakin University. He was a secondary teacher in Victoria before joining the tertiary education sector. He has written numerous monographs dealing with work, technology and education, as well as educational administration. Papers have appeared in such journals as *British Journal of Sociology of Education*, *Australian Journal of Education*, *Journal of Education Policy* and *Discourse*. His current work is on notions of flexibility in the workplace and education.

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